



**ASIAN INFRASTRUCTURE  
INVESTMENT BANK**

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**Sovereign-Backed Financing**

**Project Document**

**P000756 Republic of Rwanda: Accelerating Sustainable and Clean Energy  
Access Transformation (ASCENT) Rwanda**

## Currency Equivalents

(On January 31, 2024)

Currency Unit – Rwandan Franc (RWF)

RWF1.00 = USD0.00079

USD1.00 = RWF1,274.5

RWF1.00 = EUR0.00073

EUR1.00 = RWF1,376.9

## Borrower's Fiscal year

July 1 – June 30

## Abbreviations

AIIB	Asian Infrastructure Investment Bank
ASCENT	Accelerating Sustainable and Clean Energy Access Transformation
BRD	Development Bank of Rwanda
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide-Equivalent
EAQIP	World Bank's Energy Access and Quality Improvement Project
EDCL	Energy Development Corporation Limited
ES	Environmental and Social
ESCP	Environmental and Social Commitment Plan
ESF	World Bank's Environmental and Social Framework (ESF)
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESP	AIIB's Environmental and Social Policy
ESSP	Energy Sector Strategic Plan
EUCL	Energy Utility Corporation Limited
FM	Financial Management
GOR	Government of Rwanda
GRM	Project Grievance Redress Mechanism
GRS	WB's Corporate Grievance Redress Service
IDA	International Development Association
IFR	Interim Financial Report
LV	Low Voltage
MINECOFIN	Ministry of Finance and Economic Planning
MV	Medium Voltage
MVA	Megavolt-Ampere
MDB	Multilateral Development Bank
MININFRA	Ministry of Infrastructure
NDC	Nationally Determined Contributions
NEP	National Electrification Plan
NST	National Strategy for Transformation
OHS	Occupational Health and Safety
OSC	Off-grid Solar Company
PCU	Program Coordination Unit of EDCL
PIE	Project Implementation Entity
PIU	Project Implementation Unit of BRD
POM	Project Operations Manual

PPM	Project-affected People's Mechanism
PPSD	Project Procurement Strategy for Development
PUE	Productive Uses of Energy
RAP	Resettlement Action Plan
RBF	Results-Based Financing
REG	Rwanda Energy Group
RPF	Resettlement Planning Framework
RUEAP	Rwanda Universal Energy Access Program
RURA	Rwanda Utilities Regulatory Authority
SEP	Stakeholder Engagement Plan
SHS	Solar Home System
TA	Technical Assistance
WB	World Bank

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## 1. Summary Sheet

Project No.	P000756
Project Name	Accelerating Sustainable and Clean Energy Transformation (ASCENT) Rwanda
AIIB Member	Rwanda
Borrower	Republic of Rwanda
Project Implementation Entity	Development Bank of Rwanda (BRD); Energy Development Corporation Limited (EDCL)
Sector Subsector	Energy Multi-subsector
Alignment with AIIB's thematic priorities	Green infrastructure
Project Objective	The Project objective is to increase access to sustainable and clean energy in the Republic of Rwanda.
Project Description	<p>The Project will increase access of households and businesses to less carbon intensive and lower greenhouse gas (GHG) emitting sources of energy by increasing grid electrification and enhancing the availability of and access to clean cooking solutions. The Project comprises: (i) provision of grid-based electricity connections through grid densification in areas already covered by the grid and through grid extension to new areas; (ii) provision of off-grid electricity solutions; and (iii) provision of clean cooking solutions. Specifically, the Project scope involves:</p> <ul style="list-style-type: none"> <li>• Provision of 420,000 grid connections including related backbone infrastructure.</li> <li>• Upgrade of four 110/30kV and two 110/15kV transformers in five existing substations; construction of one 110/30kV substation, two 20 megavolt-ampere (MVA) transformers and one 110kV transmission line (21km); construction of one 220kV transmission line (56km); construction of four 30/15kV, 5MVA substations and associated medium voltage (MV) feeder lines; construction of three MV switching cabins; and extension and/or upgrade of 160km of MV lines and rehabilitation of low voltage (LV) lines in Kigali City, Southern Province and Western Province, to reinforce the transmission and distribution system and increase system efficiency and reliability.</li> <li>• Provision of at least 50,000 solar home systems (SHS), 80,000 household clean cooking technologies and 60 institutional clean cooking solutions.</li> </ul> <p>The Project will be jointly co-financed with the World Bank (WB) as the lead cofinancer.</p>
Implementation Period	04/01/24 to 12/31/29
Expected Loan Closing Date	12/31/29
Proposed Amount of AIIB Financing (USDm)	USD100.00 (equivalent)
Financing Plan	AIIB USD 100m equivalent WB USD 300m Government of Rwanda USD 103m Total USD 503m
ES Category (or AIIB equivalent, if using another MDB's ES Policy)	B
ES Category Comments	Key potential environmental impacts and risks are related to the expansion of the grid, and may include environmental degradation, generation and disposal of waste, and potential impacts on birds. Risks related to off-grid access stem primarily from electronic waste from solar panels. For both grid- and off-grid based electricity access, there exist

	<p>occupational health and safety risks and impacts on workers and communities during the Project.</p> <p>Key potential social risks and impacts are related to activities on scaling up of grid electricity and clean cooking solutions in schools. These may include impacts on people's livelihoods due to restrictions on land use and land acquisition, gender-based violence brought about by labor influx at electricity construction sites and in schools where clean cooking infrastructures will be installed, and risks related to discrimination in accessibility of Project services including solar systems.</p> <p>The ES risk rating of the Project is substantial, which is equivalent to category B if AIIB's ESF were applicable.</p>
<p>Risk (Low/Medium/High)</p>	<p>Medium</p>
<p>Conditions of Effectiveness</p>	<ul style="list-style-type: none"> <li>• The Subsidiary Agreement has been executed on behalf of the Borrower and the Project Implementing Entities, and all conditions precedent to its effectiveness have been fulfilled;</li> <li>• The Project Operations Manual has been prepared and adopted by the Borrower and each of the Project Implementing Entities in form and substance satisfactory to the Bank;</li> <li>• The Co-financing Agreement has been executed on behalf of the Co-financier and the Borrower, and all conditions precedent to its effectiveness (other than the effectiveness of this Loan Agreement) have been fulfilled;</li> <li>• The Project Co-financiers' Agreement has been executed on behalf of the Bank and the Co-financier, and all conditions precedent to its effectiveness (except for the effectiveness of this Loan Agreement) have been satisfied; and</li> <li>• The Borrower has caused the Project Implementing Entities to prepare, consult upon, disclose, and adopt: (i) the Environmental and Social Management Framework (ESMF) consistent with the national legislation and WB's ESS1, including GBV/SEA/H Action Plan consistent with the national legislation and WB's ESS4, (ii) the Labor Management Procedures (LMP) consistent with the national legislation and WB's ESS2, (iii) the Resettlement Policy Framework (RPF) consistent with the national legislation and WB's ESS5, all as set forth in the ESCP, and in form and substance satisfactory to the Bank.</li> </ul>
<p>Key Covenants</p>	<ul style="list-style-type: none"> <li>• The project coordination unit is maintained throughout the Project by both Project Implementing Entities with adequate resources, and staff with experience, qualifications, and terms of reference satisfactory to the Bank;</li> <li>• The Project Steering Committees are maintained during the Project Implementation with terms of reference, functions, resources, and mandate, satisfactory to the Bank;</li> <li>• Annual Work Plans and Budget shall be prepared by the Project Implementing Entities containing all activities proposed to be included in their respective parts of the Project during the following calendar year, and a proposed financing plan for expenditures required for such activities.</li> <li>• RBF facility is vetted, appraised, and approved in accordance the guidelines, standards and procedures set forth in the BRD Project Manual to the satisfaction of the Bank;</li> </ul>

	<ul style="list-style-type: none"> <li>Line of Credit Manual is prepared by the BRD in terms acceptable to the Bank; and</li> <li>Terms and Conditions of Funding Agreement with participating financial institutions shall be approved by the Bank.</li> </ul>
Conditions for Disbursement	<ul style="list-style-type: none"> <li>Payment of the front-end fee;</li> <li>The Borrower has caused EDCL to appoint to the EDCL Project Coordination Unit, an environmental risk management specialist, a social risk management specialist, and a Project health and safety specialist, all with experience, qualifications and under terms of reference satisfactory to the Bank;</li> <li>The Borrower has caused the BRD to: <ul style="list-style-type: none"> <li>(i) prepare and adopt the BRD Project Manual, in form and substance satisfactory to the Bank, and</li> <li>(ii) appoint or recruit to the BRD Single PIU, an environment risk management specialist, and a social risk management specialist, all with experience, qualifications and under terms of reference satisfactory to the Bank;</li> </ul> </li> <li>The Borrower has caused the BRD to: <ul style="list-style-type: none"> <li>(i) prepare and adopt the BRD Line of Credit Manual, in form and substance satisfactory to the Bank, and</li> <li>(ii) designate a senior management representative with the responsibility for overall accountability for environmental and social performance of BRD consistent with ESS9, in accordance with the ESCP.</li> </ul> </li> </ul>
Retroactive Financing (Loan % and dates)	0.0 0
Policy Waivers Requested	No
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that the proposed Bank Financing complies with the applicable Bank operational policies.
Economic Capital (ECap) Consumption (USDm)	USD36.2

President	Liqun Jin
Vice President	Konstantin Limitovskiy
Director General	Gregory Liu
Team Leader	Suzanne Shaw, Senior Infrastructure Economist
Back-up Team Leader	Tione Mtalimanja, Senior Energy Specialist
Team Members	Julius Thaler, Project Counsel Luiz Eduardo Rodrigues, Alternate Counsel Mengmeng He, Finance Officer Chitambala Sikazwe, Procurement Specialist Shodi Nazarov, Financial Management Specialist Yang Shuai, Environment Specialist Susrutha Goonasekera, Social Development Specialist Shukhrat Khojdiyev, Investment Associate Furu Hu, Assistant
Credit Officer	Young Bong Cho

## Project Description

### A. Project Overview

1. **Project Objective.** The Project objective is to increase access to sustainable and clean energy in the Republic of Rwanda.
2. **Project Description.** The Project will increase access of households and businesses to less carbon intensive and lower greenhouse gas (GHG) emitting sources of energy by increasing grid electrification and enhancing the availability of and access to clean cooking solutions. The Project planning and investments to increase access to low-carbon grid- and off- grid electricity and clean cooking solutions will be executed in alignment with the implementation plans laid out in nationally developed electrification and energy sector plans. The Project comprises: (i) provision of grid-based electricity connections, through grid densification in areas already covered by the grid and through grid extension to new areas; (ii) provision of off-grid electricity solutions; and (iii) provision of clean cooking solutions. Specifically, the Project scope involves:
  - i. Provision of 420,000 grid connections including related backbone infrastructure.
  - ii. Upgrade of four 110/30kV and two 110/15kV transformers in five existing substations; construction of one 110/30kV substation, two 20 megavolt-ampere (MVA) transformers and one 110kV transmission line (21km); construction of one 220kV transmission line (56km); construction of four 30/15kV, 5MVA substations and associated medium voltage (MV) feeder lines; construction of three MV switching cabins; and extension and/or upgrade of 160km of MV lines and rehabilitation of low voltage (LV) lines in Kigali City, Southern Province and Western Province, to reinforce the transmission and distribution system and increase system efficiency and reliability.
  - iii. Provision of at least 50,000 solar home systems (SHS), 80,000 household clean cooking technologies and 60 institutional clean cooking solutions.

The Project will be jointly co-financed with the World Bank (WB) as the lead cofinancer.

3. **Expected Results.** The Project is expected to deliver the following results that will be measured and monitored as indicated in the Results Monitoring Framework (Annex 1):
  - i. Increased number of persons provided with electricity.
  - ii. Reduction of GHG emissions.
4. **Expected Beneficiaries.** The direct project beneficiaries include households, enterprises and public institutions in Rwanda, who will gain access to affordable electricity, clean cooking solutions or productive uses of energy. Female beneficiaries will be a key focus, to address existing gaps in access to modern energy and clean cooking solutions. All grid electricity users – current users and new users to be connected through the Project – will benefit from more reliable electricity service and thus improved productivity and reduced expense as a result of damage to equipment from voltage fluctuations.

### B. Rationale

5. **Development Impact.** Rwanda has electrified its population at one of the fastest rates in the world with electricity access increasing from six percent in 2009 to roughly



72 percent as of June 2022 (50 percent grid-based and 22 percent off-grid)<sup>1</sup>. Increased electricity access has led to a decrease in energy expenditures for households and businesses and improved household living conditions.<sup>2</sup> Electricity access is however, unevenly distributed. While electricity access in urban areas was about 91.6 percent, only 57.9 percent of rural households had access to electricity. Similarly, electricity access among households in Ubudehe category 1 – the group at the bottom of Rwanda’s social protection hierarchy – was 45.4 percent, compared to 74.5 percent in Ubudehe category 3 (Ubudehe categories range from 1 to 5).<sup>3</sup> Electricity access is also lower among female-headed households, 56.9 percent compared to 66.6 percent for male-headed households. Progress towards clean cooking has been much slower, with 76 percent of households using firewood for cooking, 17 percent using charcoal and roughly two-thirds relying on open fire, three-stone or traditional cookstoves, which are the most inefficient and polluting cooking method. Maintaining the status quo has significant adverse effects for human health and advancement towards gender equality and poses significant environmental risk. Health costs from household air pollution associated with polluting and inefficient cooking fuels is estimated at USD3.5 billion per year, while the gender cost in terms of lost productivity is estimated at USD3.3 billion per year.

6. Rwanda’s development strategy is described in its seven-year plan, the National Strategy for Transformation (NST1) 2017–2024,<sup>4</sup> which seeks to lay the foundation for achieving upper middle income country status by 2035 and high-income status by 2050. Access to reliable and affordable electricity is considered a critical factor in achieving the development goals and is a cross-cutting area under the economic transformation pillar and the social transformation pillars of NST1. The July 2023 update of Rwanda’s Rwanda National Electrification Plan (NEP),<sup>5</sup> was developed to guide planning for expansion of the electricity network and increased electricity access across the country in support of the goal of universal access. It targets provision of grid-based electricity access to 65 percent of villages and off-grid solar electrification solutions for 35 percent of villages. By end-June 2023, overall household electricity access stood at 65.7 percent, with 47.6 percent grid-based access and 18.1 percent off-grid.<sup>6</sup> In addition to household electrification, Rwanda’s electrification efforts also emphasize access for productive uses.

7. Recognizing the harmful health, environment and economic impacts of using biomass in traditional cookstoves, Rwanda’s Energy Sector Strategic Plan (ESSP) aims to reduce the number of households using traditional cooking fuels from 79.9 percent in 2016/17 to 42 percent by 2024 in line with NST1 targets.<sup>7</sup> It seeks to do this through replacement of wood and charcoal-based traditional cooking technologies with cleaner and more energy efficient cooking technologies. As of August 2022, 76 percent of

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<sup>1</sup> REG, July 2022, [Annual Report 2021-2022](#).

<sup>2</sup> L. Lentz et al. 2017. [Does Large-Scale Infrastructure Investment Alleviate Poverty? Impacts of Rwanda’s Electricity Access Roll-Out Program](#). World Development, Volume 89, 2017, Pages 88-110.

<sup>3</sup> The use of Ubudehe categories for beneficiary targeting in Government programs has been discontinued as of August 2023, and a new social registry is expected to be launched with improved targeting of beneficiaries to receive Government support.

<sup>4</sup> NIRDA, [National Strategy for Transformation \(NST1\) 2017-2024](#).

<sup>5</sup> EDCL, July 2023, [A Concept Note on the Rwanda National Electrification Plan \(NEP\) 2023 Revision](#).

<sup>6</sup> Idem

<sup>7</sup> Ministry of Infrastructure of Rwanda, 2018, [Energy Sector Strategic Plan](#).

households were using firewood for cooking and 17 percent were using charcoal,<sup>8</sup> reflecting the need for accelerated progress.

8. Expanding electricity and clean cooking access will help address disparities between rural and urban households and have positive impacts on education, lifestyle, health and connectivity. Preliminary estimates indicate that achieving universal electricity – not including the costs for new generation capacity – will require USD1 billion in financing (beyond the committed financing and ongoing projects), while the Government of Rwanda (GOR) estimates that achieving the clean cooking targets outlined in Rwanda’s Nationally Determined Contributions (NDC) will require approximately USD 80 million by 2030.

9. **Climate Mitigation through Increased Energy Access.** Rwanda’s power generation capacity has more than tripled from 76 mega-watts (MW) in 2010 to 332.6 MW in 2023, while reducing reliance on oil-fired generation through investments in zero-carbon resources. The share of liquid fuel-based power in the country’s generation mix has decreased from 48 percent in 2010 to 21.3 percent in 2022, having been replaced by hydropower, lake-based methane power, and to a lesser extent by solar and peat-fueled power. As a result, the GHG intensity of grid-based electricity, which is driven largely by the share of liquid fuel in the power mix, has halved. Increasing access to grid-based electricity, roughly 50 percent of which currently hydropower based, is expected to reduce GHG emissions from the lighting alternatives that households would otherwise use, such as kerosene and candles. The GHG intensity of Rwanda’s grid-based electricity is expected to decrease further with the planned power expansion – by 2050, about 70 percent of electricity is expected to come from renewable energy sources which will reduce the GHG emissions of grid-based household lighting even more. In addition, for households not currently within the planned areas for grid connection, solar-based off-grid electricity access as a transitional measure is a much lower GHG emitting alternative to current household lighting methods. With respect to energy access for cooking, traditional cooking methods have an estimated climate impact of USD0.7 million per year as a result of GHG emissions from wood fuels collected unsustainably for cooking and the contribution of residential solid fuels to black carbon emissions. The transition to clean and more efficient cooking methods is an important part of Rwanda’s efforts to reduce its GHG emissions and targets in this area are included in the country’s NDC.<sup>9</sup>

10. **Ongoing Sector Interventions.** The GOR established the Rwanda Universal Energy Access Program (RUEAP) in 2020, as an extension of the Electricity Access Rollout program, the electrification program started in 2009. RUEAP is a multi-donor program to achieve the energy access objectives of NST1 and ESSP and builds on the experiences and lessons learned from the Electricity Access Rollout Program. Thus far the RUEAP has raised approximately USD700 million in donor financing for ongoing energy access and upstream transmission investments, through two multi-donor projects: the Energy Access and Quality Improvement Project (EAQIP) and the Transmission System Reinforcement and Last Mile Connectivity Project.

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<sup>8</sup> National Institute of Statistics of Rwanda, 2022, [5th Rwanda Population and Housing Census](#).

<sup>9</sup> UNFCCC, May 2020, [Rwanda Updated NDC](#).

11. The WB is leading the implementation of EAQIP with co-financing from Agence Francaise du Developpement, OPEC Fund for International Development and Saudi Fund for Development for a total of roughly USD290 million up to 31 December 2026.<sup>10</sup> EAQIP targets grid connection of 230,000 households, off-grid connection of 150,000 households, and provision of clean cooking solutions to 500,000 households. Thus far, EAQIP has delivered over 160,000 improved/clean cooking solutions to Rwandan households. The implementing agencies for EAQIP are the Energy Development Corporation Ltd (EDCL) and Development Bank of Rwanda (Banque Rwandaise de Developpement, BRD).

12. The African Development Bank is leading the implementation of the Transmission System Reinforcement and Last Mile Connectivity Project with financing of USD265 million up to 31 August 2026.<sup>11</sup> The project aims to provide grid-connected electricity to 77,470 households. Similarly, European Investment Bank is providing EUR100 million via its Electricity Access Rwanda project under a parallel co-financing with the African Development Bank's Last Mile Connectivity project.<sup>12</sup> The implementing entity for these two projects is EDCL.

13. **Strategic Fit for AIIB.** The proposed Project is well-aligned with AIIB's thematic priority on Green Infrastructure. It will support the reduction of greenhouse gas emissions by replacing unsustainable, inefficient and more carbon intense fuel sources for household energy use such as kerosene and charcoal, with less carbon intensive electricity, both on- and off- grid energy uses. The Project will also improve the efficiency of the electricity network which will result in lower carbon dioxide emissions during the asset operation phase.

14. **Sector and Non-Sector Strategies.** The Project is aligned with AIIB's **Energy Sector Strategy – Sustainable Energy for Tomorrow**, along four of the six Principles. It supports Principle 1 – promote energy access and security – as it will: (i) increase access to modern energy services through greater electrification and deployment of clean cooking; (ii) improve the affordability, reliability and quality of electricity supply to serve productive uses and modern society needs; and (iii) reduce negative health impacts due to indoor combustion of solid fuels. The Project also supports Principle 2 – support transition to a clean energy system – since increased grid-electrification in the context of an increasingly low-carbon grid energy mix, supports the transition to a clean energy system. It supports Principle 3 – realize energy efficiency – by investing in the distribution system to enhance grid system reliability and efficiency. Finally, it supports Principle 4 – manage local and regional pollution – by supporting the shift from the use of polluting household fuels to clean cooking and solar technologies for meeting household energy needs.

15. The Project is also aligned with the Bank's **Non-Regional Member Strategy**, based on Principle 2 of the Strategy on Financing Operations in Non-Regional Members<sup>13</sup> as the investment contributes to global public goods through climate change

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<sup>10</sup> World Bank, [Rwanda – Energy Access and Quality Improvement Project](#).

<sup>11</sup> African Development Bank, [Rwanda – Transmission System Reinforcement and Last Mile Connectivity Project](#).

<sup>12</sup> European Investment Bank, October 2020, [Electricity Access Rwanda Project](#).

<sup>13</sup> AIIB, 2018, [Strategy on Financing Operations in Non-Regional Members](#).

mitigation. Rwanda's grid-based electricity sector is dominated by renewable energy, primarily hydro (50 percent). As per the Least Cost Power Development Plan (2023-2050), the share of renewables in electricity generation is expected to be roughly seventy percent by 2030 and almost two-thirds by 2050.<sup>14</sup> By increasing access to grid electricity, the Project will support greater consumption of existing renewable energy. The efficiency improvements that will be made in the electricity distribution system will also contribute to a lower carbon-emitting system. In addition, the strengthening of the electricity distribution infrastructure under the Project will support increased future integration of variable renewable energy, which requires an efficient and flexible electricity network. The off-grid, transitional electrification solutions provided through the Project will be renewable energy based, replacing inefficient and carbon-emitting oil-lanterns, candles, and firewood. Finally, the promotion of clean and efficient cooking through the Project will reduce greenhouse gas emissions by reducing use of firewood (76 percent of cooking fuel in 2022) and charcoal (17 percent of cooking fuel use in 2022) in favor of more efficient technologies.<sup>15</sup>

16. **Paris Alignment and Climate Finance.** The Project comprises investments in electricity transmission and distribution towards greater low-carbon electricity access, as well as investments in solar home systems (SHS). These activities are considered universally aligned with the mitigation goals of the Paris Agreement, based on the Joint Multilateral Development Bank (MDB) Methodological Principles for Assessment of Paris Agreement Alignment of New Operations.<sup>16</sup> The Project also includes investments in clean cooking technologies which are considered Paris aligned since it will result in the reduction of firewood and charcoal use. In addition, the Project will finance improvements in power system reliability which will increase the efficiency of the overall electricity system and access to low carbon energy sources. This will serve to reduce annual carbon dioxide (CO<sub>2</sub>) emissions during the asset operation phase. In its NDC the GOR committed to achieve 80 percent access to modern/efficient cooking among the rural population and 50 percent access among the urban population. By contributing to these goals, the Project will support Rwanda's NDC with respect to mitigation. The Project activities related to increasing on-grid and off-grid electricity access, enhancing reliability of electricity access and increasing access to clean cooking contribute to mitigation finance. With respect to AIIB financing, the expected contribution to mitigation finance is USD80.56 million (80.56 percent of total AIIB financing),<sup>17</sup> while that of adaptation finance is USD13.10 million (13.10 percent of total AIIB financing),<sup>18</sup> for a total of USD93.66 million (93.66 percent of total AIIB financing) in climate financing. The Project is also aligned with the adaptation goals of the Paris Agreement as it considers the resilience of the relevant infrastructure assets and will incorporate climate resilience in the network assets installed under the Project. In addition, by reducing dependence on availability of traditional biomass fuels, which is subject to climate variability, the Project increases the resilience of the energy sector; at the same time, the reduced pressure on forest resources reduces the impacts of extreme rainfall events. Finally, the

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<sup>14</sup> EDCL, EUCL and REG, June 2023, [Rwanda: Least Cost Power Development Plan \(LCPDP\) 2023-2050](#).

<sup>15</sup> National Institute of Statistics of Rwanda, March 2021, [Rwanda Household Survey 2019/2020](#).

<sup>16</sup> [Joint MDB Methodological Principles for Assessment of Paris Agreement Alignment of New operations. Direct Investment Lending Operations. Version 1.0 June 2023](#)

<sup>17</sup> [Common Principles for Climate Mitigation Finance Tracking. Revision version dated 5 December 2023](#).

<sup>18</sup> European Investment Bank, 2022. [Joint methodology for tracking climate change adaptation finance](#).

Project is not inconsistent with the sectoral or national priorities for climate resilience outlined in the country's NDC.

17. Rwanda ranks 112<sup>th</sup> out of 185 countries on the Notre Dame Global Adaptation Initiative (ND-GAIN) country index.<sup>19</sup> In terms of electricity network infrastructure, the key vulnerabilities are associated with heavy rainfall, increased temperatures and temperature variability. Rainfall has become increasingly intense and the variability is predicted to increase by between 5 and 10 percent.<sup>20</sup> Temperature increases have also been experienced, with records from 1971 to 2016 showing rises in mean temperature of between 1.4°C and 2.56°C in the south-west and eastern regions of Rwanda.<sup>21</sup> A rise in temperature is predicted across Rwanda in the coming years up to 2050, especially during the dry seasons. Heavy rainfall is associated with increased risk of flooding and landslide, both considered high risk.<sup>22</sup> The Project will seek to minimize risks by targeting low flood risk areas in site selection where possible, while incorporating resilience measures in design specifications where needed. Design measures against flood damage include deep anchoring or incorporation of beams around transmission poles, and elevation of substations. Design measures against landslide may include construction of drainage to reduce landslide risk and installation of retaining walls. In terms of temperature increase and variation, there is increased risk of extreme heat (low risk) and risk of wildfire (high risk). Extreme heat may cause lines to sag resulting in contact with vegetation and other structures and can decrease transmission and distribution efficiency. The Project designs will provide for resilience measures, where justified; these may include higher power line poles and installing conductors with hotter operating limits. Adaptation options to wildfire risk that may be considered include locating power lines in low fire risk zones and undergrounding lines.

18. **Value Addition by AIIB.** Beyond the provision of financing, AIIB's participation alongside World Bank (WB) will support the quality of project preparation and effective project implementation. AIIB's participation will also strengthen GOR's focus on enhancing low-carbon energy access and supply through the efficiency upgrades in the grid electricity system and off-grid energy solutions. Furthermore, preliminary estimates indicate that achieving universal electricity access will require USD1 billion in financing (excluding the costs for new generation capacity) while the GOR estimates a required USD800 million to achieve the clean cooking targets of the NDC. AIIB financing will help to reduce the significant financing requirement, beyond the country's domestic resources, to attain the country's national targets.

19. **Value Addition to AIIB.** The Project will be AIIB's first project under the Bank's core mandate of sustainable infrastructure in Rwanda. The Project will increase AIIB's knowledge and expertise in: (i) providing electrification and energy access to low-income members; (ii) integrating climate mitigation and adaptation aspects in the electricity sector; (iii) off-grid solutions, specifically clean cooking and solar home systems; (iv)

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<sup>19</sup> University of Notre Dame, 2024, [ND-GAIN Country Index Database](#). The ND-GAIN index summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience.

<sup>20</sup> Rwanda Environment Management Authority, 2017. Detailed Implementation Plan for the Nationally Determined Contributions (NDC) of Rwanda.

<sup>21</sup> Government of Rwanda, 2018. Third National Communication: Report to the United Nations Framework Convention on Climate Change.

<sup>22</sup> Global Facility for Disaster Reduction and Recovery, 2024. [ThinkHazard! Database: Rwanda](#).

results-based financing incentives. The Project will increase AIIB's impact and visibility in Rwanda and broaden AIIB's collaboration with the country by providing the opportunity to work with a new line Ministry and implementing agency. Through the Project, AIIB will increase its understanding of Rwanda's power sector and strengthen relations with key energy sector stakeholders for future project pipeline development. It will also enhance AIIB's capacity to operate in the energy sector, in particular in low-income countries, for which greater client demand may be expected. The Project will also strengthen AIIB's partnership with the WB (lead co-financer) in Rwanda. Finally, the financing will contribute to diversification of AIIB's sovereign-backed finance portfolio.

20. **Lessons Learned.** Based on the successful application of an earlier multi-donor financed, sector-wide approach to achieving energy sector objectives, eSWAP,<sup>23</sup> ASCENT is placed under the multi-donor energy access program, RUEAP, and the successful design elements of eSWAP are replicated. This includes a framework for coordination between donors and country stakeholders for integrated technical, financial and implementation planning for the sector. In addition, the Project design integrates lessons learned from the ongoing multi donor-funded energy sector project EAQIP, which also falls under RUEAP and is implemented by the same project implementation entities (PIEs). Relevant lessons include: (i) early recruitment of additional staff required to reinforce the project implementation units so they are adequately positioned to manage the increased demands as a result of the Project; (ii) strengthening of implementing units' competencies on safeguards with the engagement of additional senior-level specialists; (iii) undertaking of advance procurement activities to gain efficiencies during implementation; and (iv) development and application of robust materials handling procedures during project implementation to ringfence donor-funded materials to minimize the risk of these materials being used in similar ongoing energy projects.

21. In addition to household electrification, Rwanda's electrification efforts also emphasize access for productive uses. With a higher electricity access rate, more efforts are needed to support productive uses of electricity for economic growth, job creation, poverty reduction and overall sector sustainability. Additional efforts may include working with other sectors to improve access to markets, training, and access to financing for acquiring energy-efficient appliances and equipment for productive use. In contrast to earlier electrification efforts, which focused primarily on increasing electrification to meet domestic energy needs, the Project also focuses on boosting electricity access and use towards economically productive ends by making productive usage more accessible and affordable for the energy consumer.

22. The use of results-based financing (RBF) incentives has been employed in earlier off-grid electrification initiatives to address affordability constraints of consumers, primarily in lower income brackets.<sup>24</sup> In this approach, RBF-participating off-grid SHS companies receive an incentive (grant) for every SHS sold to an eligible household without electricity access in off-grid areas, with the expectation that competitive pressure will induce companies to pass the grants on to end-consumers to make their products more affordable and increase sales. The experience under the pilot of the RBF incentive mechanism shows this to be the case. A similar RBF facility was established for EAQIP

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<sup>23</sup> Energy Sector Management Assistance Program, 2012, [Rwanda | Extending Access to Energy](#).

<sup>24</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2021. Enhancing energy access in rural Rwanda: Village Grid Results-based Financing Project Closing Report.

through the BRD, as a window under the BRD's existing Renewable Energy Fund. The Renewable Energy Fund is one of the main vehicles of the GOR to promote private investment in off-grid energy; it provides loans and results-based grants to households and small businesses for procuring off-grid solar devices, as well as credit lines to private sector off-grid solution providers. The RBF facility set up under EAQIP has been successful in addressing the affordability constraints of households to accelerate their uptake of off-grid electrification and clean cooking solutions. Since the launch of the RBF facility in October 2020, the off-grid RBF window has enabled over 360,000 households to access SHS and, in 2023, has seen over 13,500 new monthly connections. The RBF facility has also been successful in leveraging private sector to expand electricity access. Based on this experience, the Project will channel its support to off-grid solutions for households through the existing RBF incentive mechanisms. It will also expand the facility to cover productive-use-of-energy (PUE) technologies. Further details on the RBF facility of the Project are provided in the description of component 3 (see **Components**).

23. A credit line was also established for EAQIP, under BRD's Renewable Energy Fund, as a separate window to the RBF. The credit line provides working capital loans to eligible private companies engaged in off-grid electrification to facilitate private-sector participation in the renewable energy off-grid electrification market. In the case of on-lending, BRD on-lends funds to eligible financing institutions which extend sub-loans to eligible households, enterprises, and off-grid solar companies (OSCs) for the acquisition and, possibly in the case of the OSCs hereunder, distribution of qualifying solar systems of Tier 1 and above access level.<sup>25</sup> BRD can also provide direct loans to locally registered OSCs supporting Tier 1 or higher solar systems and locally registered OSCs serving poor households under the GOR's programs. The eligibility criteria for participating financial institutions and beneficiaries are outlined in an Operations Manual developed for the Renewable Energy Fund.<sup>26</sup> Based on WB's experience in EAQIP, the credit line has been successful in facilitating private sector participation in off-grid energy access. In view of the expanded scope of ASCENT to support PUE technologies, a new window will be added to provide a similar line of credit for PUE technologies. Additional information on the line of credit is provided in the description of component 3 (see **Components**).

### C. Components

24. **Component 1: Increasing Access to Grid Electricity (USD207.75 million IDA; USD69.25 million AIIB).** This component will support increased access to grid-based electricity which is of lower carbon intensity, and more sustainable, compared to current alternatives used by unconnected consumers. It provides for the further expansion of least-cost grid electrification to increase the grid electrification rate from 47 percent in 2022 towards the NEP target of 65 percent. AIIB and WB funds will be used to connect roughly 420,000 households (including through grid densification which will comprise connection of 79,000 of those), in target districts, while also connecting institutions and

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<sup>25</sup> The SE4All MTF initiative launched by the Secretary-General of the United Nations in 2011 aims to achieve universal access to modern energy services by 2030. The MTF measures access in the Tiered spectrum, from Tier 0 (no access) to Tier 5 (the highest level of access). Under the MTF, Tier 1 (minimum 12 Watt hour per day) is defined as providing access up to four hours per day and at least one hour at night and can be used for basic applications such as task lighting, radio, and phone charging.

<sup>26</sup> Development Bank of Rwanda, 2021. [Renewable Energy Fund Project Operations Manual](#).

productive users. This financing will serve to increase access rates in the target districts to at least 75 percent, with priority given to satellite and secondary cities, for which the target electrification rate is 80 to 95 percent. Loan proceeds will be used to extend the electricity grid to new areas, and will include the construction of new high-, medium- and low- voltage lines<sup>27</sup> and associated substations, and provision of grid connections.

25. **Component 2: Enhancing the Reliability of Electricity Service (USD54.75 million IDA; USD18.25 million AIB).** This component will support investments towards improving grid stability and reliability to provide for reliable electricity supply in the target areas and a more efficient (and thus less carbon intensive) and robust overall grid network. It will include investments in the upgrade and rehabilitation of transmission substations and selected medium-voltage (MV) and low-voltage (LV) networks which will help: (i) minimize system overloading and related supply interruptions; (ii) minimize voltage fluctuations at the end-user level; and (iii) improve operational efficiency of the distribution system.

26. **Component 3: Increasing Access to Off-Grid Electricity, Clean Cooking Solutions, and Productive Uses of Energy (USD22.5 million IDA; USD7.5 million AIB).** This component will support increased access to renewable energy-based off-grid electrification and clean cooking for households; increased access to PUE technologies for households and micro and small enterprises; a credit support facility for off-grid SHS, clean cooking solutions and PUE technologies; and scaling of clean cooking in schools. The component is comprised of five sub-components.

- (i) **Subcomponent 3a – Increasing Access to Off-Grid Electricity** (USD7.5 million IDA; USD2.5 million AIB). The Project will provide USD10 million through the existing BRD-administered RBF window to increase affordability of off-grid SHS and connect at least 50,000 households including female-headed households, in line with the NEP 2023. Subsidy levels under the RBF window are tiered based on SHS capacity.
- (ii) **Subcomponent 3b – Increasing Access to Clean Cooking Solutions** (USD3.75 million IDA; USD1.25 million AIB). This subcomponent will provide subsidies, through the existing RBF window, for the purchase of clean and efficient cooking solutions by eligible households. Technologies include cookstoves based on electricity, liquid petroleum gas (LPG) and solar. It aims to provide clean cooking solutions to 80,000 households.
- (iii) **Subcomponent 3c – Increasing Access to Technologies for Productive Uses of Energy** (USD3.75 million IDA; USD1.25 million AIB). This subcomponent will extend the RBF facility to include PUE users by providing RBF incentives and partial grants to increase the affordability of the PUE technologies, including grid-connected or solar-powered mills, pumps, fridges, welding machines and carpentry equipment. It seeks to support 5,000 small-sized enterprises through eligible PUE suppliers. The final implementation design of this subcomponent will be based on the results of

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<sup>27</sup> High voltage lines comprise 70kV, 110kV and 220kV lines; medium voltage lines comprises 6.6kV, 15kV, 17.32kV and 30kV lines; low voltage lines comprise 0.4kV lines. (Source: [Rwanda Energy Group](#)).



the ongoing WB technical assistance (TA) on PUE under the Programmatic Advisory Services and Analytics (PASA).

- (iv) **Subcomponent 3d – Increasing Access via Credit Support Facility for Off-grid Electrification, Clean Cooking Technology, and Piloting PUE Technologies** (USD3.75 million IDA; USD1.25 million AIIB). This subcomponent will provide lines of credit, directly and through eligible local financial institutions, for working capital to eligible private companies engaged in off-grid electrification, clean cooking technology and PUE, i.e., companies participating in sub-components 3a, 3b and 3c. It will build on existing credit lines under the RBF, use existing country systems to facilitate access to finance, maximize geographic coverage, and enhance the affordability of SHS, clean cooking solutions, and PUE technologies.
- (v) **Subcomponent 3e – Increasing Access to Clean Cooking for Public Institutions** (USD3.75 million IDA; USD1.25 million AIIB). This subcomponent will expand the household-level clean cooking initiatives under EAQIP to include public institutions. It will primarily target public schools but will be open to other public institutions as appropriate. Rwanda has over 8,000 schools under the GOR’s school feeding program, most of these using firewood for cooking. This subcomponent will support the switch to modern cooking technologies such as LPG, electric and solar cooking solutions, in line with the GOR’s policy to phase out biomass-based cooking solutions in public institutions.

27. **RBF Facility.** The RBF incentive mechanism provides partial grants to lower-income consumers to make SHS more affordable. In practice, RBF-participating off-grid SHS companies receive an incentive (grant) for every SHS sold to an eligible household without electricity access in off-grid areas. The companies are expected to pass these grants on to end-consumers to make their products more affordable and increase sales (experience under EAQIP shows this to be the case). The design and implementation structure of the RBF windows under components 3a, 3b and 3c will follow the arrangements established under EAQIP, which integrate past lessons learned. These include:

- (i) Application of differentiated subsidies: the level of grant available through the RBF is defined based on technology type and household income category.
- (ii) Requirement for customer contributions: there is a cap on the maximum subsidy amount per customer. To avoid market distortions, beneficiaries are required to contribute to the cost of the off-grid solution. This will also foster ownership of the system and adequate customer rights and responsibilities.
- (iii) Verification of sale prior to payment of the RBF subsidy: BRD will verify the installation and operation of the off-grid solution prior to disbursing RBF-related payments. Verification of after-sales service will also be conducted. Verification will be done by EDCL, supported by an external service provider as needed.
- (iv) Progressive disbursement of subsidies to foster sustainability in customer contributions and after-sales care: disbursements to participating companies are made over time in line with the customer’s contribution to incentivize

companies to help beneficiaries to complete their contributions by offering good customer service and competitive pricing.

- (v) Tracking the channeling of subsidies: To support the passing on of grants to target consumers, the BRD will track the cost to the end-user in two ways: (a) through the application and review process – all applicants (participating companies) to the RBF are required to share their current pricing as well as their planned pricing scheme under the RBF; (b) program monitoring – if a company is not reducing pricing to reflect the subsidy level, the company could be removed from the program.
- (vi) Regular program review: grant levels and price coverage estimates will be regularly reviewed to reflect market changes to provide for the sustainability of the program.

28. The new credit line for PUE technologies, established under component 3d will provide working capital loans to eligible private companies engaged in PUE technologies, through direct lending from BRD as well as through on-lending via local financial institutions. The PUE credit line will function in a similar manner to the credit line, established under EAQIP, for off-grid solar companies (refer to paragraph 23). The operations manual of the Renewable Energy Fund<sup>28</sup> will be updated to establish the operating procedures of the PUE credit line, in agreement with WB and AIIB.

29. **Component 4: Technical Assistance, Institutional Capacity Building, and Implementation Support for Energy Access Acceleration (USD15 million IDA; USD5 million AIIB).** This component will include activities to be implemented by EDCL (4a) and BRD (4b).

- (i) **Subcomponent 4a.** This will include, for EDCL: (i) TA to conduct studies on energy efficiency and PUE, and additional related studies as may be required to operationalize interventions identified in recently completed and ongoing assessments; (ii) institutional capacity building to provide for continued strengthening of capacity to design and efficiently implement energy sector programs; (iii) implementation support, including costs for required incremental staff and consultants for effective project implementation, RBF verification costs, and other incremental costs.
- (ii) **Subcomponent 4b.** This will include, for BRD: (i) TA for awareness raising and market facilitation in support of adoption of off-grid solar, clean cooking and PUE technologies, and assessment and studies to support program implementation; (ii) institutional capacity building needs as identified and agreed with WB and AIIB; (iii) implementation support for specific project implementation costs as agreed by WB and AIIB.

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<sup>28</sup> Development Bank of Rwanda, 2021. [Renewable Energy Fund Project Operations Manual](#).

## D. Cost and Financing Plan

**Table 1. Cost and Financing Plan**

Item	Project Cost (USD m)	Financing (USD m and %)		
		AiIB	WB	GOR*
Component 1: Increasing Access to Grid Electricity	355.5	69.25 (64.0 EURm) (25%)	207.75 (75%)	78.5
Component 2: Enhancing the Reliability of Electricity Service	96.2	18.25 (16.8 EURm) (25%)	54.75 (75%)	23.2
Component 3: Increasing Access to Off-grid Electricity, Clean Cooking Solutions, and Productive Uses of Energy	31.3	7.5 (6.9 EURm) (25%)	22.5 (75%)	1.3
Component 4: Technical Assistance, Institutional Capacity Building and Implementation Support	20	5 (4.6 EURm) (25%)	15 (75%)	
<b>Grand Total</b>	<b>503</b>	<b>100</b> (92.3 EURm)	<b>300</b>	<b>103</b>

\* Estimate. GOR is expected to cover counterpart financing to cover taxes and expropriation costs related to grid-related electricity access for the Project. Exact costs and corresponding requirements for counterpart funding will be determined prior to project construction and provided for in the GOR 2024/25 budget.

## E. Implementation Arrangements

30. **Implementation period.** The Project is expected to be implemented from April 2024 to December 2029.

31. **Institutional Arrangements and Implementation Management.** The WB will be the lead co-financier for the Project and will lead project implementation oversight. A co-financing framework agreement is in place between AiIB and WB, and the two institutions will enter a Project-level co-lenders' agreement. EDCL and BRD will jointly implement the Project and will utilize the implementation arrangements of the ongoing EAQIP, involving the same PIEs, and which are working efficiently. EDCL will implement components 1 and 2, subcomponents 3e and 4a, while BRD will implement subcomponents 3a, 3b, 3c, 3d and 4b. EDCL is a state-owned enterprise with a mandate to plan and execute generation, transmission, distribution and energy access projects in Rwanda. It is a subsidiary of the Rwanda Energy Group (REG), an entity incorporated to expand, maintain and operate the energy infrastructure in the country. BRD is a development bank established with a mandate to facilitate private sector investment in sectors critical for the achievement of national development plans and sustainable development goals, through provision of affordable, long-term and customized development finance.<sup>29</sup> Each of the PIEs for the project, EDCL and BRD, is supervised by a Board of Directors and is subject to external oversight and periodic financial management assessments and compliance monitoring from the Office of the Auditor General and the Rwanda Governance Board.

<sup>29</sup> BRD, 2022, [Integrated Annual Report 2022-Growth Beyond Recovery](#).

32. EDCL will continue to provide overall leadership for RUEAP, through a dedicated project coordination unit (PCU). ASCENT will be implemented under RUEAP. ASCENT will utilize the existing project coordination structure of EAQIP, wherein a dedicated Program Manager, within the PCU, heads the Project and reports directly to the managing director of EDCL. A Project Coordinator will be hired to manage the ASCENT project and will report to the Program Manager. Two Steering Committees, established at the RUEAP program level – Grid Electricity Steering Committee and Off-Grid, Clean Cooking and PUE Steering Committee – will continue to provide high-level government oversight and strategic guidance to the EDCL-PCU and the BRD’s project implementation unit (PIU) for their respective components. Both Steering Committees are chaired by the permanent secretary of Ministry of Infrastructure (MININFRA). WB and AfDB will be observers in both Steering Committees. Steering Committees will meet at least once per semester, or as needed, during project implementation to review implementation progress, discuss emerging challenges and identify mitigation measures.

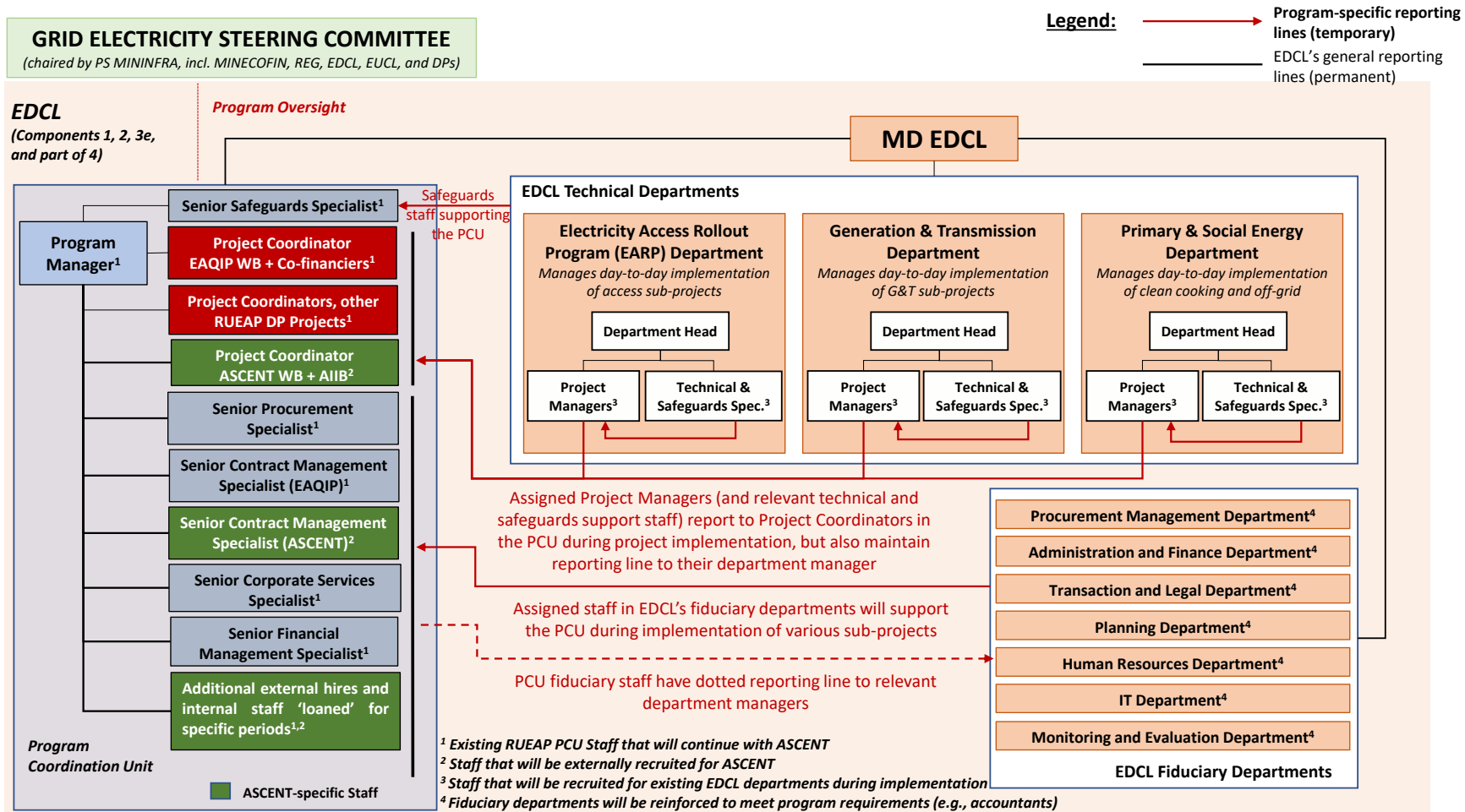
33. The detailed institutional arrangements relating to the components implemented by EDCL are provided in Figure 1. BRD-PIU will be supported by EDCL-PCU in certain technical aspects of implementation of its sub-components. Similar to EAQIP, BRD will be responsible for implementation while EDCL will cover technical aspects related to participant eligibility, application process, verification under the RBF windows, including the new RBF on PUE technologies. For BRD-related sub-components, ASCENT will utilize the existing PIU structure of EAQIP, with a Project Manager managing the ASCENT project, reporting to the head of the BRD PIU. The process flow for sub-components 3a, 3b and 3c is provided in Figure 2. The eligibility criteria will be based on the ongoing RBF programs for off-grid and clean cooking as defined in the existing operations manual for these activities,<sup>30</sup> and the manual will be updated to incorporate criteria for the new PUE RBF facility. The BRD will receive applications from interested private sector firms for off-grid access, clean cooking and PUE technologies (under separate windows), appraise and approve eligible firms, with EDCL providing technical advice in the evaluation process. As the eligible firms expand operations across target consumers, they will be able to submit claims for disbursement under the RBF facility to the BRD. The claims will be verified through a statistically relevant sample before the funds are disbursed by BRD.

34. Both the EDCL-PCU and BRD-PIU have experience in implementing projects financed by multi-lateral development banks, including WB and African Development Bank. The PCU of EDCL and PIU of BRD will be strengthened appropriately to account for the increased workload. A project operations’ manual (POM) will be developed building on the POM already in place for EAQIP.

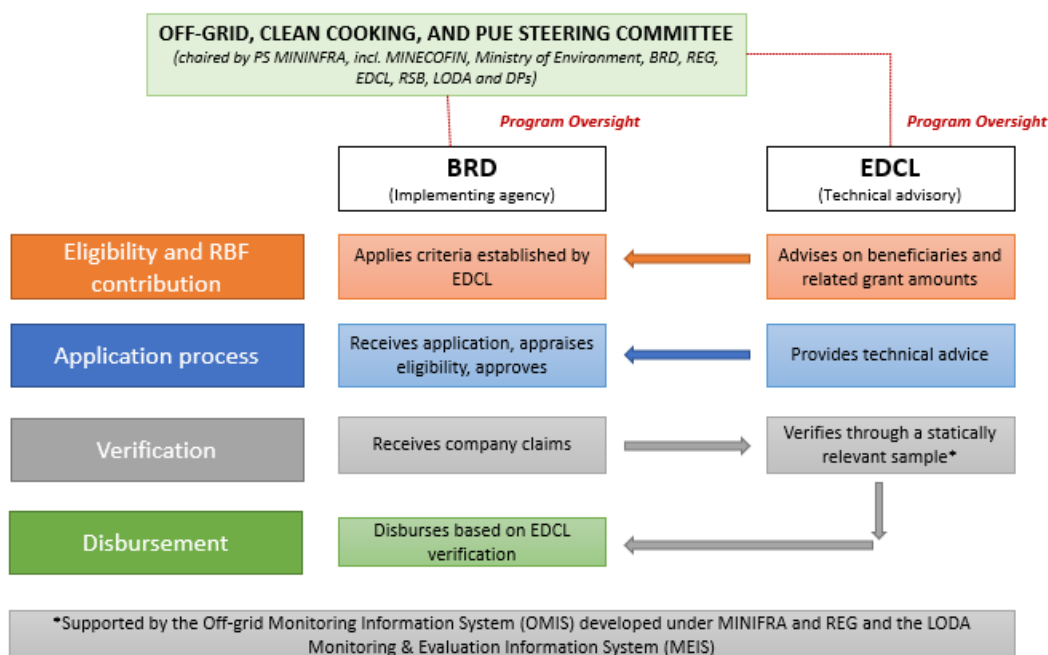
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<sup>30</sup> Development Bank of Rwanda, 2021. [Renewable Energy Fund Project Operations Manual](#)

Figure 1: Implementation Arrangements for Components 1, 2, 3e, and 4a



\* DPs = Development Partners. The previous EARP Department has been replaced by Distribution and Access Department.

**Figure 2:** Coordination between BRD and EDCL for sub-components 3a, 3b, and 3c

\* RSB = Rwanda Standards Board; LODA = Local Administrative Entities Development Agency; DPs = Development Partners

35. **Procurement Arrangements.** Procurement will be conducted in accordance with the WB's Procurement Regulations for Borrowers (November 2020) which are materially consistent with the AIIB Articles of Agreement, AIIB Procurement Policy and Procurement Instructions to Recipients. Procurement and contract management for EDCL-implemented components under the Project will be carried out by the existing EDCL-PCU created to implement the RUEAP projects. Procurement and contract management for BRD-implemented components will be carried out by BRD-PIU. Additional procurement staff will be hired in accordance with identified needs. Moreover, experienced firms will be selected for project supervision and management for each signed construction contract. Complaint management and dispute resolution will follow the requirements of the WB's Procurement Regulations for IPF Borrowers dated November 2020.

36. **Financial Management.** EDCL-PCU and BRD-PIU will be responsible for financial management and disbursement for their respective parts of the Project. Modified accrual basis accounting will be followed for Project accounting. EDCL-PCU and BRD-PIU will maintain Project accounts and have custody of supporting documents. They will report quarterly on the Project's financial progress through separate Interim Financial Reports (IFRs) to be submitted within 45 days of the end of each quarter. EDCL-PCU and BRD-PIU will present the Project's audited financial statements for their respective parts of the Project, for each year of Project implementation, within six months following their respective financial year-end.

37. **Environmental and Social.** The Project's environmental and social (ES) implementation will align with that of the ongoing WB-financed EAQIP, with EDCL-PCU managing grid-related elements and BRD-PIU overseeing off-grid electrification, clean cooking, and PUE technologies, guided by experienced ES specialists. The Client will

prepare and submit quarterly monitoring reports on the Project's ES performance throughout the Project implementation period.

38. **Monitoring and Evaluation.** Monitoring and evaluation (M&E) of project implementation progress and results indicators, as well as progress toward achievement of the project objective, will be the responsibility of both EDCL-PCU and BRD-PIU. EDCL and BRD shall ensure adequate M&E staffing to support M&E activities as provided for within component 4 of the Project. EDCL-PCU and BRD-PIU will be responsible for the collection, verification, and collation of information, integration of the M&E reports, and the development and timely submission of quarterly and annual progress reports to WB and AIIB. The implementing entities will leverage their existing database for each component of the project to periodically monitor the progress of implementation, outputs, and results, with systems for regular data gathering and processing of information required to monitor the main performance indicators and intermediary indicators as defined in the Results Framework. During each year of Project execution, the implementing entities will also provide regular updates on progress in the execution of the AWPB for that year, as part of M&E activities.

## 2. Project Assessment

### A. Technical

39. **Project Design.** The Project will contribute to the GHG emissions reduction by supporting increased grid access and off-grid electricity access nationally. The strategic planning and execution of electricity access investments will be conducted in line with the country's NEP, which was specifically developed to guide the country's electrification program. Grid access will be provided through grid densification and extension using MV and LV distribution lines and the installation of distribution transformers to supply 420,000 connections, consistent with the targets of the ESSP. Alternatives of using mini-grid or off-grid options with distributed energy resources like micro hydro, wind or solar photovoltaic were considered in targeted areas, however, these were discounted due to their higher investment costs compared to grid-based access and resource constraints in some instances (land, costly resettlement, conservation areas, solar intensity, wind and water resources). Off-grid access will be provided to 50,000 households through SHSs; the alternative of using mini grids with distributed energy resources was discounted due to higher investment costs.

40. For the activities related to reinforcing electricity transmission and distribution, the most feasible alternative considered was the "do nothing" option since transmission and distribution networks are natural monopolies. With a significant number of new grid connections and no reinforcements, the "do nothing" option would create network overloads resulting in power interruptions, increased network losses and poor-quality supply to existing and new customer connections. This might induce customers to opt for alternative, more carbon intensive, sources of energy, such as diesel generators for businesses and fuel wood for household cooking, inconsistent with ESSP and NDC targets. Similarly, the "do nothing" alternative for cooking solutions would not be in line with the ESSP target of reducing the number of households using traditional cooking technologies and reducing unsustainable biomass units.

41. The backbone distribution and transmission networks in targeted grid access districts will require reinforcement to provide for quality and reliability of supply in the face of increased grid usage, in addition to overall grid improvement. The transmission system has inadequate transfer capacity into the distribution system, with existing constraints on transformer capacities in some parts of the network. The Project will upgrade transfer capacity through replacement of transformers with higher-rated units at selected sub-stations and construct two new transmission lines. The Project will support distribution grid investments aimed at improving the reliability of the power supply through grid extensions and creation of comprehensive switching mechanisms to avoid operating constraints, minimize supply interruptions and improve system efficiency and voltage profiles. The distribution scope of works include extension and upgrade of 160km MV lines, rehabilitation of LV lines, the installation of 198 distribution transformers in Kigali City, Southern Province and Western Province, installation of MV switching cabins, and construction of substations. Details of the investments to improve grid stability and reliability of supply are outlined in Table 2.

**Table 2. Sub-projects for network strengthening**

Sub-Project	Rationale	Budget (USDm)
Transmission system works		
1	Upgrade of four 110/30kV and two 110/15 kV transformers in five high-voltage sub-stations (Kigoma, Birembo, Rukarara, Kibuye and Rwinkwavu)	11.3
2	Construction of Muhanga 110/30kV substations, two 20MVA transformers with a cut-in cut-out (double circuit) 110kV transmission line Kigoma substation-Mt. Kigali substation (21km)	13.5
3	Construction of 220kV double circuit transmission line connecting Bwishyura substation to Kigoma substation (56km)	10
Distribution system works		
4	Construction of four 30/15kV, 5MVA substations at Nyagatovu (Rwamagana district), Karumuna (Bugesera district), Shyorongi (Rulindo district) and Poids Lourd (Rubavu district)	8
5	Construction of three MV switching cabins in Rubavu (1) and Kigali (2)	6.5
6	Strengthening of MV and LV distribution network in Kigali City, Southern Province and Western Province	21



	Sub-Project	Rationale	Budget (USDm)
7	Construction of 29.8km of MV lines for linking of new HV/MV substations to the distribution network	This will facilitate the linking of HV/MV substations (newly constructed and ongoing) to the distribution network via existing MV lines to maximize the utilization of those substations as well as to create more than N-1 solution in the network.	2.7

42. An active off-grid RBF program has been in place for over two years. All off-grid SHSs imported to Rwanda must comply with the requirements of the Ministerial Guidelines on Minimum Standards Requirements for Solar Home Systems, which includes guidance on product quality standards, service-level requirements, warranty periods, and the terms of after-sales care. To be eligible for RBF financing, OSCs are required to comply with the Ministerial Guidelines and submit a business plan detailing the commercial viability of service provision through combined customer contributions and RBF grant financing, taking into account the provision of adequate after-sales services, which should be granted until three months after warranty expiration. All participating providers sign a grant subsidy agreement with BRD, and are required to comply with the Operations Manual for the RBF,<sup>31</sup> which details the standards used in the RBF verification process. The clean cooking solutions provided under the Project will also adhere to government guidelines and incorporate international good practice. The Project will provide technical assistance to further review and improve the government standards and testing, to improve local product design, and to encourage local solutions to be eligible for the Project.

43. **Operational sustainability.** The sustainability of the Project is dependent on several key factors namely: (i) GOR commitment and alignment with the project development objective; (ii) strengthening the capacity of PIEs through the use of experts in the project implementing units during implementation; and (iii) the financial health of Energy Utility Corporation Limited (EUCL) to operate and manage network assets post implementation. The GOR has demonstrated strong commitment and ownership of the proposed Project. The Project is part of the government-driven multi-donor program, RUEAP, which is aimed at progressing the government's energy sector targets under the ESSP. The RUEAP, and the ASCENT project concept, were developed under the GOR's leadership, as well as through an extensive and participative consultation process. This participatory approach provides for the incorporation of lessons learned from similar programs in the Project design to foster sustainability of Project outcomes. The Project's design includes a mix of public and private financing, with a view to enhancing the enabling environment for supporting the electrification and cooking solutions in an affordable and sustainable way.

44. Upon completion of the grid components, EDCL will transfer the network assets to EUCL who will be responsible for operations and maintenance (O&M) of the assets during their lifecycle. EUCL is an experienced network operator with a track record of managing network assets financed through similar projects in the past. In response to

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<sup>31</sup> Development Bank of Rwanda, 2023. [Window 5 Operations Manual](#).

the growing asset base, EUCL has steadily increased its workforce in the past three years to meet the corresponding O&M demands and increased its O&M budget allocation.

## **B. Economic and Financial Analysis**

45. **Economic Analysis.** A cost benefit analysis (CBA) was carried out by considering “without project” and “with project” scenarios. The economic benefits for the Project include, for grid-connected customers: (i) avoided cost of diesel-based electricity generation; (ii) avoided GHG emissions from decreased diesel consumption and from improved grid efficiency; (iii) reduction in unserved demand from grid interruptions due to grid reinforcement. For off-grid customers, economic benefits include: (i) avoided cost of alternative methods of lighting; and (ii) avoided greenhouse gas emissions. With respect to clean-cooking solutions, economic benefits include: (i) fuel savings from use of more efficient cookstoves; and (ii) avoided GHG emissions. Additional benefits, not quantified as part of the CBA, include increased productivity from a more reliable electricity supply and from access to PUE, avoided health costs associated with emissions from using traditional lighting and cooking solutions, time saved in collecting traditional fuels, and time saved in using traditional cooking solutions. The economic costs of the Project include the up-front costs – namely the combined investment financed from WB and AIIB funds – for provision of electricity or clean cooking solution, and the ongoing operation and maintenance costs.

46. The results of the CBA, shown in Table 3, indicate that the Project demonstrates strong economic viability. The investment has positive economic net present value (ENPV) and an economic internal rate of return (EIRR) above ten percent for each of the Project activities – grid-based electricity access, off-grid electricity access and clean cooking solutions – both in the case where GHG benefits are taken into account and where they are not. The Project as a whole is also economically viable. Project ENPV is estimated to be USD137.1 million, without taking into account GHG benefits and USD224.1 million with GHG benefits taken into account. Project EIRR is 15.0 percent without GHG benefits and 18.6 percent with GHG benefits included. The provision of grid-based electricity access is justified since the savings from diesel-based generation and avoided GHG emissions outweigh the costs of grid connection and reinforcement. In addition, the improvements in the grid stability provide a benefit through the supply of electricity to meet demand that would otherwise go unserved due to power interruptions in absence of the Project. The reduction in unserved demand is 11.8 GWh in year 1 of the Project and increases to 47.8 GWh by the end of the Project’s economic lifetime. The detailed cost-benefit analysis, including key assumptions, is provided in **Annex 2: Economic and Financial Analysis**.

**Table 3. Results of cost-benefit analysis for the Project**

Intervention	Without GHG Benefits		With GHG Benefits	
	NPV (USD m)	EIRR	NPV (USD m)	EIRR
Grid-based electricity access (incl. grid extension and reinforcement) (components 1&2 combined)	127.2	14.6%	192.3	16.9%
Off-grid SHS electricity	6.62	67.7%	8.30	87.1%
Clean cooking solutions	3.27	19.7%	23.57	73.3%
<b>Overall Project</b>	<b>137.1</b>	<b>15.0 %</b>	<b>224.1</b>	<b>18.6 %</b>

47. A sensitivity test indicates the investment is robust in the face of potential under-estimation of investment costs or over-estimation of benefits. In a scenario with 20 percent higher investment costs and 10 percent lower benefits, overall ENPV remains positive and EIRR above ten percent. The Project remains strongly economically viable. Details are included in **Annex 2: Economic and Financial Analysis**.

48. **Financial Analysis.** The financial analysis focuses on the financial sustainability of the utility, EUCL, as the entity that will be responsible for the ongoing operation and maintenance of the grid-related assets. EUCL relies on GOR grants for operational sustainability as the existing tariff structure, while taking into account affordability to end-users, does not allow for full recovery of EUCL's costs to provide the electricity. In the "with project" scenario, the Project's assets will be transferred to the EUCL, which will be responsible for subsequent operation and maintenance. The Bank's financial analysis analyzes EUCL's operating profit, excluding depreciation, over the same period considered for the economic lifetime of the Project. The Project is projected to generate incremental revenues from additional electricity sales, however, with the current tariff regime EUCL's overall revenues will not be sufficient to cover its costs of operation, and GOR subsidies will still be required to provide for the company's financial sustainability. When GOR subsidies are taken into account, EUCL's projected financial position is one of net profit for entirety of the period. The detailed financial analysis is provided in **Annex 2: Economic and Financial Analysis**.

49. GOR has demonstrated strong commitment to providing grants to EUCL for its continued operations, and the power sector has been undergoing progressive reform to strengthen financial sustainability. Reforms were initiated in 2013, to streamline operations, improve operational efficiency and financial performance and create an off-taker entity for private sector produced power. Reforms included separation of electricity functions from the former combined water and utility, Electricity and Water Sanitation Authority, to create the Rwanda Energy Group (REG) and its two subsidiaries, EUCL and EDCL, with distinct financial accountability between non-revenue operations (energy development activities, under the responsibility of EDCL) and revenue operations (electricity utility operations, under EUCL). Moreover, power sector reforms have been supported by WB through capacity strengthening provided to EUCL and EDCL and through financing to support investment operations and policy reform. The regulator, Rwanda Utilities Regulatory Authority (RURA), has established a clear tariff methodology, with allocation between generation, transmission and distribution segments, and has provided for periodic review, consistent with established good

practice in economic regulation.<sup>32</sup> Indeed, the tariff has been reviewed periodically and adjusted with a view to providing additional revenue towards EUCL's sustainability. There have been four tariff revisions in the last ten years.<sup>33</sup> However, tariffs are not cost-reflective, and subsidies remain part of EUCL financing structure. The GOR has, however, demonstrated commitment towards the financial sustainability of the electricity sector through committing to contain electricity subsidies to within 1.4 percent of GDP, through a series of WB-financed Energy Sector Development Policy Financings implemented from 2017 to 2021.<sup>34</sup>

50. One consideration in the tariff revenues is the exchange rate fluctuation. EUCL procures electricity in USD whereas its revenues are in RWF; the RWF has exhibited steady depreciation against the USD at an average annual rate of 7.2 percent over the last ten years. There are ongoing discussions for tariff review, to provide for exchange rate volatility and improved cost recovery for EUCL through tariffs. The expectation is that the ongoing tariff review discussions will provide for an increase in electricity tariffs, and it is anticipated that an agreement between EUCL and GOR will be reached soon. The GOR has a strong interest to ensure financial sustainability of EUCL given the significant role of energy services in social protection and the GOR's commitment to this.

51. In addition, according to EUCL, the financial sustainability of the company is expected to improve in the near future as the ongoing investments to develop and improve the power park will reduce the costs of electricity production and thus EUCL's costs of electricity. Committed plants in the pipeline are dominated by relatively low-cost power plants which are expected to come online in the future.

### C. Fiduciary and Governance

52. **Procurement.** The WB, as lead co-financier, will be responsible for overseeing the procurement process, applying its own procurement rules, internal review and clearance procedures, and determining whether the procurement has been conducted in accordance with the agreed implementation arrangements. The Project Procurement Strategy for Development (PPSD), the Procurement Plan and the Procurement Self-Assessment have been reviewed by AIIB and found to be satisfactory. AIIB will collaborate closely with WB to review updates to the Procurement Plan and the PPSD during project preparation and implementation. Further, AIIB will rely on the strong track record of WB in the sector and its ability to conduct adequate supervision and monitoring. The Project's procurement risk is rated Medium. Eligibility to participate in the tendering will be open to firms from all countries, which is consistent with AIIB's International Open Competitive Tendering procedure. AIIB will rely on the WB to provide assurance of compliance with the WB Procurement Regulations. The Procurement Plan comprises:

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<sup>32</sup> United Nations Economic Commission for Africa, 2021. [Regulatory Review of the Electricity Market in Rwanda: Towards Crowding-in Private Sector Investment](#)

<sup>33</sup> RURA, 2015. [Decision No. 001/BD/ICA-CLIA/RURA/2015](#); RURA, 2017. [Decision No. 05/BD/ER-LER/RURA/2016](#); RURA, 2018. [Decision No. 002/BD/ER-/RURA/2018](#); RURA, 2020. [Decision No. 01/BD/ER-EWS/RURA/2020](#).

<sup>34</sup> WB, 2017. [First Programmatic Energy Sector Development Policy Financing \(P162671\), November 2, 2017](#); WB, 2018. [Second Rwanda Energy Sector Development Policy Financing \(P166458\), October 19, 2018](#); WB, 2019. [Third Rwanda Energy Sector Development Policy Operation \(P169040\), June 21, 2019](#); WB, 2020. [Rwanda Energy Supplemental Development Policy Financing \(P173882\), April 16, 2020](#).

- (i) Various packages of design, supply and install contracts for LV and MV lines and service connections. These are based on geographic spread and will be tendered out using international open competition;
- (ii) Various packages of substation upgrades/construction and MV line construction to be tendered out using international open competition;
- (iii) Various packages of assorted electrical materials based on geographic spread and to be tendered out using international open competition;
- (iv) Various packages of supervision consultancies and studies to be tendered out using international open selection.

EDCL will consider using Advance Procurement subject to its requirements. EDCL has experience in similar procurements and has incorporated lessons learnt from past projects. Analysis shows that there are no significant market risks.

53. **Financial Management.** Based on the assessment conducted, the residual FM risk is Medium, and the following measures have been agreed with the client by the WB: (i) EDCL and BRD shall develop respective project POMs including detailed FM chapters for the proposed Project prior to effectiveness of the AIB and WB loans; (ii) EDCL and BRD will assign its current finance staff to support the proposed Project immediately after effectiveness and will appoint or recruit dedicated FM specialists for the proposed Project with agreed terms of reference within three months after effectiveness; and (iii) the annual work plan and budget will be prepared annually by May 31 for EDCL and November 30 for BRD with details showing financiers' proportion of financing for each activity, to guide finance teams in expenditure allocation.

54. EDCL and BRD have adequate and experienced finance staff for their regular operations. Both entities will assign finance staff to support day-to-day FM activities under the supervision of Project-specific FM specialists (to be appointed or recruited) in the respective project implementing units (PCU for EDCL and PIU for BRD). Additional staff will however be needed to handle the Project's FM requirements, and the PCU and PIU will appoint or recruit FM specialists for the Project. The appointed/recruited finance staff will maintain dual reporting lines to: (i) their respective Project-specific FM specialists in PCU and PIU, and (ii) the respective department heads in EDCL and BRD. Both entities are already implementing the ongoing WB-funded EAQIP project and have previously implemented other WB-funded projects. They therefore have sufficient experience dealing with the WB's FM and disbursement requirements.

55. The Project will follow the government's planning and budgeting procedures. The Project budgets shall also be presented to the National Steering Committee for approval and included in the overall country budgets approved by Parliament. The approved budgets will be monitored on a monthly and quarterly basis by the preparation and analysis of budget execution reports, including: (i) budget for the period and for the year; (ii) actual expenditure for the period and to-date; (iii) future expenditure commitments; and (iv) balance of period budget remaining (actual expenditure and commitments together compared to period budget). The consolidated annual work plan and budget, which will clearly show planned activities under each component and implementing entity, shall be submitted to the WB and AIB for no objection.

56. Both implementing entities are governed by the legal frameworks and adopted manuals. EDCL and BRD shall develop respective POMs that reflect the FM

arrangements under this project, building on experience and arrangements from the existing WB-funded operations. The EDCL POM and BRD POM will reflect detailed internal control arrangements for the Project, including the extent of segregation of functions in payment processing and internal check mechanisms, in addition to payment approval and authorization arrangements. To enhance internal control arrangements for the Project, the internal audit units in EDCL and BRD will conduct at least an annual review of project activities and submit reports to the project management team, the WB and AIIB.

57. The Project financial records at both implementing entities shall be maintained using the entities' automated accounting systems, which can generate required reports. Unaudited IFRs shall be prepared by EDCL and BRD for their respective components and submitted to the WB quarterly. AIIB will receive those IFRs and the review results from the WB. The IFRs shall be in format and content as discussed and agreed with the WB for all WB-funded projects in Rwanda, and the reports shall be submitted within 45 days of the end of the related quarter period. IFRs for each implementing entity holding Designated Accounts shall, at a minimum, include the following: sources and uses of funds (revenues and expenditures statement), financial position statement, cash flow statement, budget execution report, Designated Account activity statement for each Designated Account, notes on accounting policies and appendices. In addition, monthly reports shall be prepared by EDCL, for the entire Project, and submitted to MINECOFIN for internal monitoring purposes.

58. The internal audit units in EDCL and BRD will conduct at least an annual review of project activities for the respective PIE and submit reports to the project management team and to the WB and AIIB. In addition, an external audit will be conducted, annually, on EDCL by the Office of Auditor General (OAG), and on BRD by hired independent external auditors. The audit reports and management letters will be submitted to the WB and AIIB within six months of the end of the financial year. The WB will share the review results of the audit reports with AIIB. Upon receipt of the audit reports, each implementing entity will be expected to prepare an action plan to address the audit findings. Follow-up on the implementation of audit recommendations will be conducted as part of regular supervision missions. The quality and timeliness of the submission of audit reports for the ongoing WB-funded projects have been satisfactory.

59. **Disbursements.** All Project disbursements will be handled by the WB according to its disbursement procedures using the WB's Client Connection System. The WB shall receive withdrawal applications from EDCL and BRD and forward the payment requests to AIIB. AIIB will directly process requested funds to the Designated Accounts opened for each implementing entity's Project parts.

60. The Project will maintain segregated Designated Accounts for EDCL and BRD – one each for each cofinancer – at the National Bank of Rwanda. The currency of the Designated Accounts is US Dollars or other hard currency as agreed upon with MINECOFIN. EDCL and BRD will also each maintain a corresponding project operational account denominated in Rwandan francs. Each operational account will be funded from the WB and AIIB Designated Accounts for the respective PIE, such that cofinancers' funds are co-mingled in the operational accounts. The IFR will show the expenditure allocated to each financier, using the IFR-based method, covering six-month forecasts of cashflow needs, and will be submitted quarterly. The Project may

also use other traditional disbursement methods like direct payments, reimbursement, and special commitments. The details of the final arrangement and other disbursement specifics will be finalized through the issuance of the WB's Disbursement and Financial Information Letter.

61. AIIB funds will finance the eligible expenditures according to the stipulated percentages under different sub-components to be implemented by the PIEs.

62. **Governance and Anti-corruption.** The World Bank's Anticorruption Guidelines apply to the Project. To the extent that Prohibited Practices are not covered by the World Bank's Anticorruption Guidelines, AIIB's Policy on Prohibited Practices applies. AIIB is committed to preventing fraud and corruption in the projects it finances, thus, the Bank reserves the right to investigate, directly or indirectly through its agents, any alleged corrupt, fraudulent, collusive, coercive, or obstructive practices, and misuse of resources and theft or coercive practices relating to the Project and to take necessary measures to prevent and address any issues in a timely manner, as appropriate. Detailed requirements will be specified in the Loan Agreement and the AIIB-funded packages' tender documents.

#### **D. Environmental and Social**

63. **Environmental and Social Policy and Categorization.** The Project's ES risks and impacts have been assessed in accordance with the WB's Environmental and Social Framework (ESF). To provide for a harmonized approach to addressing the ES risk and impacts of the Project, and as permitted under AIIB's Environmental and Social Policy (ESP), the WB's ESF will apply to the Project in lieu of AIIB's ESP. AIIB has reviewed the WB's ESF and is satisfied that: (i) it is consistent with AIIB's Articles of Agreement and materially consistent with the provisions of AIIB's ESP, including the Environmental and Social Exclusion List and the relevant Environmental and Social Standards; and (ii) the monitoring procedures that are in place are appropriate for the project. The WB has categorized the ES risks of the project as Substantial (which is equivalent to Category B if AIIB's ESP were applicable).

64. **Environmental Aspects.** The potential environmental risks and impacts related to the Project during the construction and operation/maintenance phases are diverse and are expected to have both positive and negative impacts on the environment, as well as potential health and safety (OHS) risks to workers and communities if not managed properly. The proposed activities under the Project, including civil works related to MV and LV power transmission and distribution lines, may have potential risks and impacts on biodiversity, natural resources, and/or cultural heritage sites. These include terrestrial habitat alteration, aquatic habitat alteration, hazardous materials, change of land use, vegetation clearance and tree cutting for right of way and other activities. The Project will not finance any activities that could adversely affect biodiversity conservation or the sustainable management of living resources. There will be no significant land conversion as a result of the Project. Potential OHS issues include management of oils and lubricants for transformers and supporting infrastructure. The planned activities under component 2 could also pose environmental and OHS risks during replacement of transformers in the existing substations and construction of new ones and associated feeder connections. The Project's technical assistance involving improvements in sector performance and policy/regulations may also entail direct and

indirect ES risks. Furthermore, there are also potential ES risks related to off grid solutions under component 3, which include electronic waste management issues comprising storage and final disposal of used batteries containing hazardous waste, recycling/disposal of solar panels from stand-alone SHS and related OHS issues such as fire and explosion risks from clean cooking solutions.

65. **Social Aspects.** The Project will have both positive and negative social impacts on people and communities in implementation areas. The key social risks and potential adverse impacts are related to project activities to scale up grid electricity access and clean cooking solutions in schools. These may include impacts on people's livelihoods due to restrictions on land use and land acquisition, gender-based violence (GBV) brought about by labor influx at electricity construction sites and in schools where clean cooking infrastructures will be installed, and risks related to discrimination in accessibility of project services including solar systems. Social risks and impacts are expected to be site specific, predictable, and temporary, which may be prevented, managed and/or mitigated through the application of established mitigation measures, as detailed in the project's ES instruments.

66. **Environmental and Social Instruments.** To mitigate these risks, in compliance with WB's ESF, the Client has prepared the appropriate ES instruments: the Environment and Social Commitment Plan (ESCP), Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF), Stakeholder Engagement Plan (SEP), Labor Management Procedures and has already disclosed SEP<sup>35</sup> and ESCP<sup>36</sup>. The ESMF will provide for an exclusion list to exclude high-risk activities, particularly interventions in protected areas and critical habitats, and will incorporate Biodiversity Management Plans if significant impacts are anticipated. The remaining documents will be finalized and disclosed as per the ESCP. The Project shares the same typology and implementing unit as previous, similar projects, such as EAQIP, and will therefore use, and build on, the existing experience from implementing these earlier projects. Site-specific instruments such as Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), or other appropriate environmental and social risk management instruments required for the respective subproject activities will be ready before launching of the related contractor bidding process. For sub-components 3a to 3d, which are being implemented by BRD, ES risks and impacts will be managed through BRD's existing Environmental and Social Management System (ESMS), which is already being applied for WB-funded EAQIP. AIIB and WB will review the ESMS to assess its adequacy, and any necessary changes will be completed prior to implementation of these activities. AIIB will work alongside WB in the review of site-specific ESIA, ESMP and/or other environmental and social risk management instruments required for the subproject activities, and in the review and finalization of ES instruments.

67. **Gender.** The Project will build on the efforts made under ongoing projects and help to address gender equality gaps, specifically by strengthening women's access to new and improved energy, namely grid and off-grid electricity, clean cooking solutions and PUE technologies, and by creating energy sector jobs for females in the science,

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35 GOR, October, 2023, [Draft Stakeholder Engagement Plan \(SEP\) of ASCENT](#)

36 GOR, November 2023, [Negotiated Environmental and Social Commitment Plan \(ESCP\)](#)



technology, engineering and mathematics fields. Progress towards closing these gender gaps in Rwanda's energy sector will be monitored through indicators in the results monitoring framework.

68. **Stakeholder Engagement and Project Grievance Redress Mechanism (GRM).** The client has prepared a SEP which includes evidence of the documentation of the consultations carried out that respects the privacy and identities of stakeholders involved. The SEP takes into consideration lessons learnt from EAQIP, which is under implementation, and seeks to address existing gaps regarding documentation and reporting on stakeholder engagement throughout project implementation. SEP has laid out all project stakeholders identified, conducted project information disclosure, and shared plans for awareness raising and capacity building of Grievances Redress Committees. To facilitate that all stakeholders and project affected people are identified, informed and engaged, the SEP has laid out separate strategies to reach the most vulnerable people and groups including youth, women, elderly and people with disabilities among others. An operational GRM at the level of the implementing agencies and at sub project level will be established prior to commencement of Project activities and will be operationalized and maintained throughout Project implementation. The GRM will be accessible to stakeholders at both Project and sub-project level and the information will be disclosed in a timely and appropriate manner. In addition to the aforementioned GRM, a commensurate mechanism will be made available at the contractor level for workers' grievances. Communities and individuals may also submit complaints to the WB's Grievance Redress Service (GRS). Information on the WB's GRS is available at <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>.

69. **Independent Accountability Mechanism.** As noted above, the WB's ESF will apply to this Project instead of AIB's ESP. The WB's Independent Accountability Mechanism, the Inspection Panel, which reviews the WB's compliance with its policies and procedures, will handle complaints relating to the WB's compliance with its ESF with respect to the Project. In accordance with AIB's Policy on the Project Affected People's Mechanism (PPM), submissions made to the PPM regarding such complaints under this Project will not be eligible for consideration by the PPM. Information on WB's Inspection Panel is available at: <http://www.inspectionpanel.org>.

70. **Monitoring and Supervision Arrangements.** The Client will prepare and submit quarterly monitoring reports on the Project's ES performance throughout the Project implementation period. AIB will monitor the Project's ES management performance together with WB through these reports and during its implementation support missions.

## E. Risks and Mitigation Measures

**Table 4. Summary of Risks and Mitigating Measures**

Risk Description	Assessment (H/M/L)	Mitigation Measures
<p><b>Financial Management</b> Non-compliance in FM disbursement process due to:</p> <ul style="list-style-type: none"> <li>• Undocumented Project-specific FM and disbursement arrangements</li> <li>• Increased workload for finance staff</li> <li>• Delays in preparation and submission of annual work plan and budget</li> </ul>	<p><b>Medium</b></p>	<ul style="list-style-type: none"> <li>• EDCL and BRD shall develop respective POMs that will include detailed FM and disbursement arrangements</li> <li>• EDCL and BRD will assign its current finance staff to support the Project immediately after effectiveness and the PCU and PIU will appoint or recruit the required additional finance staff within three months after effectiveness</li> <li>• The annual work plan and budget is required to be prepared by May 31 for EDCL and November 30 for BRD</li> </ul>
<p><b>Environmental and Social:</b></p> <ul style="list-style-type: none"> <li>• Environmental degradation</li> <li>• Waste disposal</li> <li>• Risks to birds</li> <li>• OHS risks</li> <li>• Risks of sexual exploitation, abuse and harassment</li> <li>• Discrimination or exclusion of disadvantaged or vulnerable people</li> <li>• Adverse impacts on livelihoods due to restrictions on land use</li> <li>• Risks of labor and working conditions in the supply chain</li> </ul>	<p><b>Medium</b></p>	<ul style="list-style-type: none"> <li>• Client will prepare ES instruments in compliance with WB's ESF prior to disbursement</li> <li>• Client will maintain adequate and qualified ES resources to coordinate ES risk management, stakeholder engagement, and grievance redress mechanisms throughout project implementation</li> <li>• Client will prepare and submit regular ES monitoring reports during project implementation</li> <li>• Client will carry out capacity building activities, for staff and subcontractors and consultants, on ES instruments' implementation during project implementation.</li> </ul>
<p><b>Procurement:</b></p> <ul style="list-style-type: none"> <li>• Corruption, collusion, and conflict of interest;</li> <li>• Contractor cash flow problems;</li> <li>• Inflation, currency stability and interest rates;</li> <li>• Extreme weather / intense rainfall/ land slide</li> <li>• Inadequate personnel in procurement and/or knowledge of WB procurement procedures</li> <li>• Inadequate participation of bidders in engineering procurement and</li> </ul>	<p><b>Medium</b></p>	<ul style="list-style-type: none"> <li>• EDCL and the PCU will improve the complaints management system and implement a code of ethics for staff along with internal control systems. Internal and external audits will be conducted on procurement activities.</li> <li>• EDCL-PCU will verify the financial capacity of the successful bidder prior to contract award. The draft contract will provide for advance payment and payments will be made to contractors in a timely manner</li> <li>• Price adjustment clauses will be included in contracts which exceed 18 months</li> <li>• EDCL-PCU will verify that contractor designs and work plans account for</li> </ul>

Risk Description	Assessment (H/M/L)	Mitigation Measures
<p>construction contract bidding process</p>		<p>extreme weather considerations. Designs and plans will be monitored by a consultant. Work in landslide prone areas will be avoided during rainy season</p> <ul style="list-style-type: none"> <li>• PCU will recruit the required additional procurement staff . PCU procurement staff will be trained on WB-procurement policies</li> <li>• The ASCENT project will train existing PCU staff and PCU will hire additional procurement staff</li> <li>• PCU will design bidding documents and qualification requirements to target the relevant expertise. Bids will be adequately publicized to attract bidders</li> </ul>
<p><b>Overall Risk</b></p>	<p><b>Medium</b></p>	

## Annex 1: Results Monitoring Framework

Project Objective:	To increase access to sustainable and clean energy in the Republic of Rwanda.				
Indicator Name	Unit of measure	Baseline (2023)	End Target (2029)	Frequency of Tracking	Responsibility
<b>Project Objective Indicators:</b>					
1. People provided with electricity service	Number	0	1,880,000	Annually	EDCL, BRD
2. Greenhouse gas emissions reduced	Metric ton	0	1,760,000	Annually	EDCL, BRD
<b>Intermediate Results Indicators:</b>					
<b>1. Increased access to grid electricity</b>					
1.1 Households provided with access to grid electricity	Number	0	420,000	Quarterly	EDCL
1.2 Productive users provided with access to grid electricity <ul style="list-style-type: none"> <li>Women led/owned businesses provided with new or improved access to grid electricity</li> </ul>	Number	0	1,200	Quarterly	EDCL
	Number	0	120		
<b>2. Enhanced reliability of electricity service</b>					
2.1 Length of transmission lines added (km)	km	0	77	Annually	EDCL
2.2 Total transmission transformer capacity added (MVA)	MVA	0	150	Annually	EDCL
2.3 Length of distribution MV lines added (km)	km	0	160	Annually	EDCL
2.4 Total distribution transformer capacity (MV/LV) added (MVA)	MVA	0	20	Annually	EDCL
<b>3. Increased access to off-grid electricity, clean cooking and productive uses of electricity</b>					
3.1 Households provided with access to off-grid electricity	Number	0	50,000	Quarterly	BRD
3.2 PUE technologies distributed <ul style="list-style-type: none"> <li>Women led/owned businesses benefitting from distributed PUE technologies</li> </ul>	Number	0	5,000	Quarterly	BRD
	Number	0	500		
3.3 Public institutions provided with new or improved access to clean cooking solutions	Number	0	60	Quarterly	EDCL
3.4 Amount of private capital mobilized	USD	0	30,000,000	Quarterly	BRD
3.5 Households provided with new or improved access to clean cooking solutions	Number	0	80,000	Quarterly	BRD
<b>4. Improved institutional capacity for project implementation</b>					
4.1 Beneficiaries who report satisfaction with enhanced access to electricity	Percentage	0	80%	Annually	EDCL
4.2 Women with STEM degrees employed in enterprises financed by the Project	Percentage	0	5%	Annually	BRD
4.3 Minimum energy performance standards adopted	Number	0	1	At completion	EDCL
4.4 GRM cases/complaints resolved	Percentage	0	90%	Annually	EDCL, BRD

## Annex 2: Economic and Financial Analysis

### Economic analysis.

1. **Approach and Methodology.** A cost-benefit analysis was undertaken to assess the economic viability of the Project, based on a comparison between “with-” and “without-” project scenarios. The without project scenario assumes that unconnected customers would otherwise meet their electricity needs through diesel-based generators (for consumers targeted for grid-connection under the Project) or through alternative lighting energy sources (for consumers targeted for off-grid access under the Project). The EIRR and ENPV of the project were estimated using discounted cash flow analysis of economic costs and benefits. All costs used in the model are exclusive of taxes. A sensitivity analysis was performed to evaluate the impact of increased investment costs and decreased benefits.

2. **Economic costs and benefit.** The economic costs of the Project include the up-front costs – namely the combined investment financed from WB and AIIB funds – for provision of electricity or clean cooking solutions, and the ongoing operation and maintenance costs. The economic benefits for the Project include, for grid-connected customers: (i) avoided cost of diesel-based electricity generation; (ii) avoided GHG emissions from decreased diesel consumption and from improved grid efficiency; (iii) reduction in unserved demand from grid interruptions due to grid reinforcement. For off-grid customers, economic benefits include: (i) avoided cost of alternative methods of lighting; and (ii) avoided greenhouse gas emissions. With respect to clean-cooking solutions, economic benefits include: (i) fuel savings from use of more efficient cookstoves; and (ii) avoided GHG emissions.

3. **Key Assumptions grid-based electricity.** The main assumptions used in the analysis for grid-based electricity are as follows:

- Growth in electricity consumption: consumption growth is assumed to follow the projections of the GOR’s Least Cost Power Development Plan for the period 2023-2050, namely 10% per year to 2030 and 5% per year to 2050<sup>1</sup>
- System losses decrease in time in line with the Least Cost Power Development Plan
- Grid emission factor: the GHG emission factor of the grid evolves in line with the projected electricity generation mix of the Least Cost Power Development Plan
- Constant 2023 prices: all costs and benefits are represented in constant 2023 prices
- Economic life of the grid-access related investments: 23 years
- Average grid connection cost: 730 USD/household (including VAT)
- Avoided cost of diesel-based self-generation:<sup>2</sup> 67 USc/kWh

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<sup>1</sup> REG, June 2023, [Rwanda: Least Cost Power Development Plan \(LCPDP\) 2023-2050](#).

<sup>2</sup> Calculated based on 3kW diesel generator

- Emission factor of diesel-based generation: 1.1 kgCO<sub>2</sub>e/kWh
- Reduction in unserved demand as a result of grid reinforcement: 40 percent
- Benefits assumed to accrue starting in the year(s) in which the investment(s) are made
- Discount rate: 9 percent

For off-grid electricity access and clean cooking solutions, the following assumptions are used in the analysis:

- Average cost of SHS: 207 USD/system (including VAT)
- Annual O&M cost for SHS: 2% per year
- Economic lifetime of SHS: 5 years
- Avoided cost of alternative lighting expense: 72 USD/year
- Cost of cooking stoves: traditional wood stove (tier 0): 2 USD/system; wood improved stove (tier 3): 35 USD/system; charcoal stove (tier 2): 7 USD/system; charcoal improved stove (tier 3): 45 USD/system; LPG stove (tier 5): 70 USD/system
- Thermal efficiencies of cooking stoves: traditional wood stove (tier 0): 0.15%; wood improved stove (tier 3): 0.3%; charcoal stove (tier 2): 0.25%; charcoal improved stove (tier 3): 0.3%; LPG stove (tier 5): 0.55%
- Technology shares: 70% of cookstove users switch to tier 3 technologies, of which 25% to charcoal and 75% wood; 30% of cookstove users switch to tier 4/5 (LPG). Of the users of wood improved stoves (tier 3), the share of households collecting wood is 90%, while 10% purchase wood
- Subsidy levels: 50% of stove cost is covered by the RBF grant subsidy, for all types of cookstoves delivered through the Project
- Economic lifetime of clean cooking solutions: 5 years

4. **Cost-benefit analysis.** The results show that the Project is economically viable. The EIRR for the individual Project activities are, without and with GHG benefits (refer to Table 5): 14 percent (18 percent when accounting for GHG benefits) for grid-based electricity access (including connections and grid improvements); 68 percent (87 percent) for off-grid SHS; and 20 percent (73 percent) for clean cooking. The EIRR of the overall Project is 15 percent without GHG benefits and 19 percent when GHG benefits are taken into account. The ENPV of the Project is estimated at USD137.1 million, without taking into account GHG benefits and USD224.1 million with GHG benefits taken into account. Project EIRR is 15.0 percent without GHG benefits and 18.6 percent with GHG benefits included. The annual streams of costs and benefits are provided in Table 7.

**Table 5. Results of cost-benefit analysis for the Project**

Intervention	Without GHG Benefits		With GHG Benefits	
	NPV (USD m)	EIRR	NPV (USD m)	EIRR
Grid-based electricity access (incl. grid extension and reinforcement)	127.2	14.6%	192.3	16.9%
Off-grid SHS electricity	6.62	67.7%	8.30	87.1%
Clean cooking solutions	3.27	19.7%	23.57	73.3%
<b>Overall Project</b>	<b>137.1</b>	<b>15.0 %</b>	<b>224.1</b>	<b>18.6 %</b>

5. **Sensitivity analysis.** A sensitivity analysis of the EIRR and the ENPV was conducted to assess the impact of adverse changes in key variables. Specifically, it considers the result in the face of potential under-estimation of investment costs or over-estimation of benefits. For the sensitivity test in relation to reduction of benefits, the following assumptions are made with respect to each of the interventions: (i) for grid-based electricity access, the electricity tariff is assumed to be 10 percent lower; (ii) for off-grid electricity access, the cost of alternative sources of lighting is assumed to be lower by 10 percent; and (iii) for clean cooking solutions, the fuel cost savings are assumed to be lower by 10 percent. In a scenario with 20 percent higher investment costs and 10 percent lower benefits, overall ENPV remains positive and EIRR above ten percent (Table 6).

**Table 6. Sensitivity test**

Intervention	Benefits reduced by 10%		Investment costs higher by 20 %		Combined reduction in benefits + increase in costs	
	NPV (USD m)	EIRR	NPV (USD m)	EIRR	NPV (USD m)	EIRR
Grid-based electricity access (incl. grid extension and reinforcement)	190.2	17%	117.4	14%	115.7	14%
Off-grid SHS electricity	6.88	71%	5.65	58%	4.47	47%
Clean cooking solutions	22.11	70%	17.67	59%	16.56	56%
<b>Overall Project</b>	<b>219.2</b>	<b>18%</b>	<b>140.8</b>	<b>15%</b>	<b>136.8</b>	<b>15%</b>

**Table 7. Detailed estimated costs and benefits over the life of the Project**

Year	Project Costs			Grid Electrification			SHS		Cooking Solutions		Total Benefits	Net Benefit
	Investment Costs	O&M Costs	Total Cost	Avoided Cost of Diesel Generation	Electricity Sales	Avoided GHG	Avoided Cost of Lighting alternatives	Avoided GHG	Savings in Fuel Costs	Avoided GHG		
1	(33,564,386)	(5,256,663)	(38,821,049)	7,861,496	1,126,972	347,019	360,000	45,892	0	0	9,741,379	(29,079,670)
2	(97,858,157)	(12,844,449)	(110,702,605)	21,532,544	1,239,669	1,122,375	1,505,386	189,306	705,930	909,998	27,205,207	(83,497,398)
3	(130,005,042)	(24,355,000)	(154,360,042)	42,583,649	1,363,636	2,419,346	3,147,482	384,348	1,882,480	2,502,494	54,283,435	(100,076,607)
4	(67,128,771)	(32,367,338)	(99,496,109)	57,235,832	1,499,999	3,332,977	4,113,000	494,776	3,294,340	4,445,718	74,416,642	(25,079,467)
5	0	(35,513,530)	(35,513,530)	62,959,415	1,649,999	3,772,512	4,299,759	501,947	4,706,200	6,540,608	84,430,440	48,916,911
6	0	(38,956,798)	(38,956,798)	69,255,356	1,814,999	4,213,182	4,045,499	464,660	4,706,200	6,635,400	91,135,295	52,178,498
7	0	(42,711,062)	(42,711,062)	76,180,892	1,996,499	4,763,047	2,819,462	314,075	4,000,270	5,801,235	95,875,481	53,164,418
8	0	(43,390,615)	(43,390,615)	83,798,981	2,196,149	6,636,535	982,495	107,560	2,823,720	4,151,864	100,697,304	57,306,689
9	0	(45,486,807)	(45,486,807)	87,988,930	2,305,956	7,159,046	0	0	1,411,860	2,132,807	100,998,600	55,511,793
10	0	(47,724,647)	(47,724,647)	92,388,377	2,421,254	7,712,826	0	0	0	0	102,522,457	54,797,810
11	0	(50,074,380)	(50,074,380)	97,007,796	2,542,317	8,208,193	0	0	0	0	107,758,306	57,683,927
12	0	(52,541,598)	(52,541,598)	101,858,185	2,669,433	8,839,345	0	0	0	0	113,366,963	60,825,364
13	0	(54,273,033)	(54,273,033)	106,951,095	2,802,904	11,227,554	0	0	0	0	120,981,553	66,708,520
14	0	(56,950,185)	(56,950,185)	112,298,649	2,943,050	12,076,197	0	0	0	0	127,317,896	70,367,712
15	0	(59,761,194)	(59,761,194)	117,913,582	3,090,202	12,981,636	0	0	0	0	133,985,420	74,224,226
16	0	(62,712,754)	(62,712,754)	123,809,261	3,244,712	13,947,428	0	0	0	0	141,001,401	78,288,648
17	0	(65,811,891)	(65,811,891)	129,999,724	3,406,948	14,977,345	0	0	0	0	148,384,017	82,572,126
18	0	(68,893,269)	(68,893,269)	136,499,710	3,577,295	15,014,152	0	0	0	0	155,091,158	86,197,889
19	0	(72,301,432)	(72,301,432)	143,324,696	3,756,160	16,107,266	0	0	0	0	163,188,122	90,886,690
20	0	(75,880,004)	(75,880,004)	150,490,931	3,943,968	17,272,156	0	0	0	0	171,707,055	95,827,051
21	0	(79,637,504)	(79,637,504)	158,015,477	4,141,166	18,513,267	0	0	0	0	180,669,911	101,032,407
22	0	(83,582,879)	(83,582,879)	165,916,251	4,348,225	19,835,309	0	0	0	0	190,099,785	106,516,905
23	0	(87,677,414)	(87,677,414)	174,212,064	4,565,636	18,716,722	0	0	0	0	197,494,422	109,817,008
Total	(328,556,356)	(1,198,704,445)	(1,527,260,801)	2,320,082,893	62,647,150	229,195,437	21,273,084	2,502,565	23,530,999	33,120,124	2,692,352,252	1,165,091,451
ENPV	(261,101,727)	(390,039,235)	(651,140,962)	738,592,501	20,961,104	65,069,984	14,183,686	1,677,820	14,501,915	20,294,347	875,281,358	<b>224,140,396</b>
EIRR												<b>18.6%</b>



## Financial analysis

1. The Project's financial analysis was performed to assess the financial sustainability of the utility, EUCL, which will be responsible for the ongoing operation and maintenance of the grid-related assets. EUCL is responsible for the transmission, distribution and sale of electricity generated from government-owned power plants operated under concession and from independent power producers. All capital investments in the grid are financed by the GOR; the investments are channeled through EDCL. Once the investments are completed, the assets are handed over to EUCL as a grant. EUCL therefore does not have capital costs or investment-related financing costs as part of its financial considerations; its financial sustainability is thus based on its ability to adequately finance its everyday operations. In an effort to make electricity affordable to end-consumers, the GOR sets differentiated tariffs based on defined consumption thresholds, to account for differences in household socio-economic standing; at the same time, these tariffs are generally not sufficient to cover EUCL's costs to provide electricity to end-users. GOR provides subsidies to bridge the shortfall, however these are not always sufficient to bring EUCL to financial profitability. Table 8 presents EUCL's overall financial position from operations for the last 3 years. As shown, EUCL presents a profit for 2021, but presents losses in 2022 and 2023. Notwithstanding, GOR has a consistent track record of providing subsidies to EUCL as can be seen from Table 8.

2. The Bank conducted an analysis of EUCL's operating profit, excluding depreciation, and taking into account GOR subsidies. It is assumed that any capital expenses to reinvest in network assets to offset depreciation are borne by the GOR, since EUCL is not responsible for capital investments in the grid. The projections by the Bank are based on the historical performance of EUCL over the last six years, and do not take into account expected decreases in operational costs from the anticipated introduction of lower cost electricity from newly committed plants – which are dominated by relatively low-cost plants – expected to come online in the future. It also does not take into account expected increases in revenue from future anticipated tariff increases. The results of the analysis indicate that, based on current electricity tariffs and historical average costs ratio, EUCL is expected to operate at a loss when GOR subsidies are not taken into account (refer to Table 9). The Bank's analysis indicates that EUCL demonstrates profitability when GOR subsidies are taken into account. The company's projected net profit is RWF9 billion in 2024 and RWF33 billion in 2045 when projected subsidies are accounted for.

**Table 8. Financial position of EUCL for last 3 years (RWF)<sup>1</sup>**

<b>Item</b>	<b>30-Jun-23</b>	<b>30-Jun-22</b>	<b>30-Jun-21</b>
Revenue	164,860,686,280	144,282,955,741	127,948,878,814
Cost of Sales	(186,929,708,651)	(150,571,483,028)	(96,470,048,808)
<b>Gross Profit</b>	<b>(22,069,022,371)</b>	<b>(6,288,527,287)</b>	<b>31,478,830,006</b>
Grants and subsidies*	37,284,233,545	39,352,863,859	25,581,651,870
Other income	11,616,283,659	6,158,848,472	6,465,709,501
Grant income under other income	1,950,921,711	4,858,338,128	4,260,899,057
Distribution costs	(19,363,537,222)	(14,897,720,233)	(14,661,210,644)
Administrative expenses	(24,866,861,617)	(23,628,908,056)	(20,621,775,811)
<b>Operating profit before interest, tax, depreciation and amortization</b>	<b>(15,447,982,295)</b>	<b>5,554,894,883</b>	<b>32,504,103,979</b>
Depreciation and amortization	(30,750,390,003)	(28,638,006,488)	(21,697,595,529)
<b>Operating (loss)/profit</b>	<b>(46,198,372,298)</b>	<b>(23,083,111,605)</b>	<b>10,806,508,450</b>
Interest income	26,441,246	26,728,728	14,946,588
Finance costs	(7,307,108,427)	(8,245,897,033)	<b>(10,039,853,276)</b>
<b>(Loss)/Profit before tax</b>	<b>(53,479,039,479)</b>	<b>(31,302,279,910)</b>	<b>781,601,762</b>
Income tax credit/expense	16,171,819,407	(21,202,421,041)	1,241,668,057
<b>(Loss)/Profit for the year</b>	<b>(37,307,220,072)</b>	<b>(52,504,700,951)</b>	<b>2,023,269,819</b>

\* From GOR

<sup>1</sup> REG, 2021, [Consolidated Annual Report and Audited Financial Statements, Year-Ended 30<sup>th</sup> June 2021](#). EUCL, 2022, [Audit Report on Financial Statements, Year-Ended 30<sup>th</sup> June 2022](#). EUCL, 2023, Audit Report on Financial Statements, Year-Ended 30<sup>th</sup> June 2023.

**Table 9. AIIB analysis on EUCL Current and Projected Financial Position (billion RWF) – under scenario of no tariff adjustment and no change in operating cost ratio \***

Cash Flow	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Operating Expenses	(194.9)	(197.4)	(199.3)	(219.2)	(241.1)	(265.2)	(291.8)	(320.9)	(353.0)	(370.7)	(389.2)	(408.7)	(429.1)	(450.6)	(473.1)	(496.7)	(521.6)	(547.6)	(575.0)	(603.8)	(634.0)	(665.7)	(699.0)	(733.9)
Admin Expenses	(23.6)	(24.9)	(30.3)	(33.3)	(36.6)	(40.3)	(44.3)	(48.7)	(53.6)	(56.3)	(59.1)	(62.1)	(65.2)	(68.4)	(71.9)	(75.5)	(79.2)	(83.2)	(87.3)	(91.7)	(96.3)	(101.1)	(106.2)	(111.5)
<b>Total Expense</b>	<b>(218.5)</b>	<b>(222.3)</b>	<b>(229.5)</b>	<b>(252.5)</b>	<b>(277.7)</b>	<b>(305.5)</b>	<b>(336.1)</b>	<b>(369.7)</b>	<b>(406.6)</b>	<b>(427.0)</b>	<b>(448.3)</b>	<b>(470.7)</b>	<b>(494.3)</b>	<b>(519.0)</b>	<b>(544.9)</b>	<b>(572.2)</b>	<b>(600.8)</b>	<b>(630.8)</b>	<b>(662.4)</b>	<b>(695.5)</b>	<b>(730.3)</b>	<b>(766.8)</b>	<b>(805.1)</b>	<b>(845.4)</b>
Revenue and Other Income from Customers	150.4	176.5	191.1	210.2	231.2	254.3	279.8	307.8	338.5	355.5	373.2	391.9	411.5	432.1	453.7	476.3	500.2	525.2	551.4	579.0	607.9	638.3	670.3	703.8
<b>Operating Profit/Loss</b>	<b>(68.1)</b>	<b>(45.8)</b>	<b>(38.4)</b>	<b>(42.3)</b>	<b>(46.5)</b>	<b>(51.2)</b>	<b>(56.3)</b>	<b>(61.9)</b>	<b>(68.1)</b>	<b>(71.5)</b>	<b>(75.1)</b>	<b>(78.9)</b>	<b>(82.8)</b>	<b>(86.9)</b>	<b>(91.3)</b>	<b>(95.8)</b>	<b>(100.6)</b>	<b>(105.7)</b>	<b>(111.0)</b>	<b>(116.5)</b>	<b>(122.3)</b>	<b>(128.4)</b>	<b>(134.9)</b>	<b>(141.6)</b>
Grant/Subsidies at current ratio to Revenue	44.2	39.2	47.3	52.1	57.3	63.0	69.3	76.2	83.9	88.1	92.5	97.1	101.9	107.0	112.4	118.0	123.9	130.1	136.6	143.4	150.6	158.1	166.0	174.3
<b>Net Result</b>	<b>(23.9)</b>	<b>(6.6)</b>	<b>8.9</b>	<b>9.8</b>	<b>10.8</b>	<b>11.8</b>	<b>13.0</b>	<b>14.3</b>	<b>15.8</b>	<b>16.5</b>	<b>17.4</b>	<b>18.2</b>	<b>19.1</b>	<b>20.1</b>	<b>21.1</b>	<b>22.2</b>	<b>23.3</b>	<b>24.4</b>	<b>25.7</b>	<b>26.9</b>	<b>28.3</b>	<b>29.7</b>	<b>31.2</b>	<b>32.7</b>

\* Annual figures represent figures as at end-June of the year indicated

It should be noted that the analysis presents a likely worst-case scenario in terms of anticipated tariffs and costs of sales, since it assumes no improvements from historical trends. There are ongoing discussions for tariff review, to provide for exchange rate volatility and improved cost recovery for EUCL through tariffs. The GOR has a track record of periodic tariff revisions to account for increased operating costs for EUCL, while seeking to balance affordability constraints. There have been four tariff revisions over the last ten years, as outlined in

3. Table 10 below. The revision in 2015 increased the single tariff applicable for all residential and non-residential customers by 35.8 percent, from 134 RWF/kWh to 182 RWF/kWh. In 2017, tariffs for residential and non-residential customers were revised to provide for a progressive tariff structure, based on defined blocks of monthly consumption, with the initial block of consumption (the first 15kWh/month for residential customers, and the first 100 kWh/month for non-residential customers) charged at a lower tariff than additional kWh consumed in higher consumption blocks. The revisions in 2018 and 2020 did not increase the applicable tariff for residential customers in the first consumption block, but increased tariffs for the second and third blocks. In 2018, the tariff for the third block increased by 11.1 percent compared to 2017, and in 2020 the tariffs for the second and third blocks increased by 16.5 percent and 18.6 percent respectively compared to 2018. For non-residential customers, tariffs by 7.9 percent in 2018 and 11.3 percent in 2020 for the first consumption block, and by 15.6 percent in 2018 and 14.9 percent in 2020 for the second consumption block. For industrial customers, tariffs were initially decreased in 2018 but then increased across all three defined blocks in 2020, by between 17.5 percent and 21.8 percent. The expectation is that the ongoing tariff review discussions will provide for an increase in electricity tariffs, and it is anticipated that an agreement between EUCL and GOR will be reached soon. The GOR has a strong interest to ensure financial sustainability of EUCL given the significant role of energy services in social protection and the GOR's commitment to this. Moreover, according to EUCL, the financial sustainability of the company is also expected to improve in the near future as a result of the ongoing investments to develop and improve the power park, particular with the introduction of low-cost hydropower. These investments will reduce the costs of electricity production and thus EUCL's operating costs.

**Table 10. Electricity tariffs for residential, non-residential and industrial consumers over the previous ten years (Source: RURA)<sup>1</sup>**

Category	Consumption block per month (kWh)	Before 2015	2015	2017	2018	2020
		RWF/kWh	RWF/kWh	RWF/kWh	RWF/kWh	RWF/kWh
Residential	0-15	134	182	89	89	89
	15-50			182	182	212
	>50			189	210	249
Non-Residential	0-100	134	182	189	204	227
	>100			192	222	255

Category	Consumption Category	2017	2018	2020
		RWF/kWh	RWF/kWh	RWF/kWh
Industrial	Small	126	110	134
	Medium	90	87	103
	Large	83	80	94

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<sup>1</sup> RURA, 2015. [Decision No. 001/BD/ICA-CLIA/RURA/2015](#); RURA, 2017. [Decision No. 05/BD/ER-LER/RURA/2016](#); RURA, 2018. [Decision No. 002/BD/ER-RURA/2018](#); RURA, 2020. [Decision No. 01/BD/ER-EWS/RURA/2020](#).

## Annex 3: Member and Sector Context

### A. Country Context

1. The Rwandan economy experienced a robust annual growth rate of around seven percent between 2010 and 2019. Rwanda exhibited a strong recovery from the COVID-19 pandemic induced slowdown, recording a 10.9 percent GDP growth in 2021, and 8.2 percent in 2022, driven by strong private consumption, rapid recovery in tourism, as well as growth in industry and services. Economic growth is projected to moderate to 6.2 percent in 2023, primarily due to a weaker global environment, the necessity of implementing restrictive monetary policies to curb inflation, and diminished agricultural output caused by recent flooding. However, it is anticipated to rebound to nearly seven percent starting from 2024, supported by government's robust public investment and a continued revival of tourism.

2. Rwanda's medium term development strategy is outlined in its latest seven-year plan, the NST1,<sup>2</sup> where access to reliable and affordable electricity is recognized as a critical factor in achieving development goals. Rwanda's long-term development strategy is outlined in the Vision 2050,<sup>3</sup> which sets the groundwork for attaining upper-middle-income country status by 2035 and ultimately achieving high-income status by 2050. It includes five pillars, where ensuring sustainable supply and demand for energy is a main priority under the Urbanization and Agglomeration pillar.

3. Rwanda has achieved significant progress in poverty reduction and human development. Between 2001 to 2017, poverty as measured by the international poverty line decreased from 77.2 to 55.5 percent. Additionally, Rwanda has made notable strides in reducing inequality, as indicated by the decline in the Gini coefficient.<sup>4</sup> Nevertheless, poverty reduction momentum has been weakening recently. Persistent weather shocks continue to pose significant threats to rural livelihoods and the ongoing efforts to alleviate poverty. The escalation in food prices, attributed to unfavorable weather conditions adversely impacting agricultural yields, is disproportionately affecting vulnerable populations. In addition, the momentum of structural transformation has also faltered, impacting the economy's capacity to generate nonfarm employment. The agricultural sector continues to play a substantial role in job creation, with its share actually expanding. While agriculture accounted for less than 15 percent of new job opportunities during the period from 2001 to 2011, this has surged to 50 percent between 2011 and 2017, and further to 60 percent from 2017 to 2019.

4. Despite strong progress in its education system over the past 25 years, Rwanda's overall Human Capital Index, as of 2017, was still below the Sub-Saharan Africa average, even if generally at levels expected at Rwanda's income level. Education is critical in facilitating Rwanda's structural transformation. Further endeavors are needed in expanding basic education and improving the quality of education. Rwanda has also achieved major gains in infrastructure development, particularly in access to electricity, clean water, and sanitation services. Electricity plays a central role in its NST1, with a goal to achieve universal electricity access in Rwanda. Despite the considerable

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<sup>2</sup> NIRDA, [National Strategy for Transformation \(NST1\) 2017-2024](#).

<sup>3</sup> MINECOFIN, 2015, [Republic of Rwanda Vision 2050](#).

<sup>4</sup> WB, 2005-2016, [Gini Index Rwanda](#).

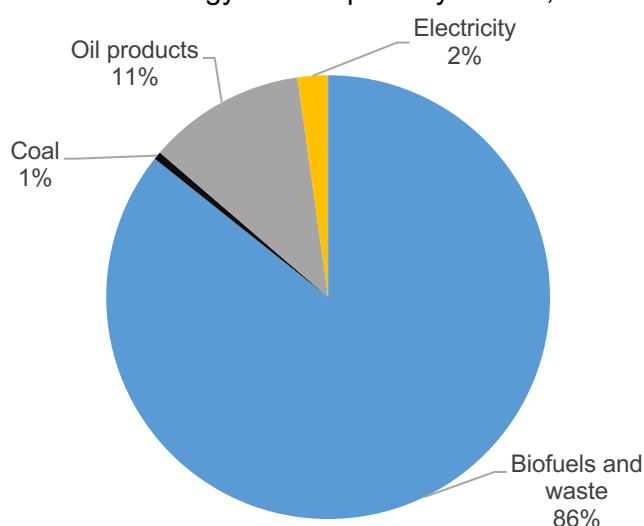
progress made, much work still needs to be done in scaling up electricity generation and ensuring efficiency and financial sustainability of the sector. Furthermore, Rwanda has implemented extensive reforms in its investment climate to place Rwanda at 38<sup>th</sup> position in global Doing Business rankings of 190 countries.<sup>5</sup>

## B. Sector Context

### Introduction

5. Rwanda's final energy consumption is predominantly met with traditional biomass. Biofuels and waste accounted for 86 percent of total final energy consumption in 2021, followed by oil (11%), electricity (2%), and coal (1%) (Figure 3). The residential sector is the dominant consumer of energy, representing 82 percent of energy consumption.<sup>6</sup> Decreasing the use of unsustainable and inefficient biomass and charcoal for cooking is a key priority for the GOR by 2030. Rwanda is endowed with natural energy resources including hydro, solar, and methane gas in Lake Kivu in the west of the country. Electrification and energy efficiency constitute main levers to reduce Rwanda's CO<sub>2</sub> emissions and increase the welfare of its citizens.

**Figure 3:** Rwanda final energy consumption by source, 2021<sup>7</sup> (source: IEA)



### Electricity Access and Clean Cooking

6. Electricity access and clean cooking are central to the 2030 Agenda for Sustainable Development and the Paris Agreement on climate change. SDG 7, which calls for “ensuring access to affordable, reliable, sustainable and modern energy for all” to be achieved by 2030,<sup>8</sup> represents the first-ever universal goal on energy. It includes, among others, targets on ensuring universal access to affordable, reliable and modern energy services. The roadmap set targets for universal access to electricity and clean cooking solutions by 2030. However, 760 million people are still without access to

<sup>5</sup> WB, 2023, [Doing Business Archive](#).

<sup>6</sup> IEA, 2023, [World Energy Balances](#).

<sup>7</sup> IEA, 2023, [World Energy Balances](#).

<sup>8</sup> Sustainable Energy For All platform, 2023, [Sustainable Development Goal 7](#).



electricity<sup>9</sup> – four in five being in sub-Saharan Africa, while around 2.3 billion people worldwide still do not have access to clean cooking.

7. Rwanda has electrified its population at one of the fastest rates in the world over the past decade, with access to electricity rising from six percent in 2009 to an estimated 72 percent as of June 2022.<sup>10</sup> Electricity access, however, is unevenly distributed, with poorer people and women having lower access overall. Rwanda's electrification progress has been achieved through a strong political commitment to the universal electricity access goal, embracing geospatial least-cost electrification planning, which leverages both grid and distributed renewable energy technologies and mobilization of private sector, with a coordinated approach across all donors and financiers. According to REG's annual report, 50 percent of Rwandan households are connected to the national grid and 22 percent of households through off-grid solar solutions, delivered through the private sector, which have scaled up in the past five years. Rwanda has established a pro-poor financing mechanism for both grid and off-grid users, which has helped overcome affordability constraints of low-income households and maintain the fast pace of electrification even as efforts are now reaching rural and low-income households.

8. With 76 percent of households using firewood for cooking and another 17 percent using charcoal,<sup>11</sup> progress toward cleaner cooking solutions has been much slower, limiting improvements in health outcomes and deforestation. Traditional cooking technologies based on biomass such as firewood and charcoal are the most prevalent method of cooking in Rwanda. More than half of Rwandan households use three-stone fires for cooking. Rwanda's high population growth and density has exerted pressure on natural resources especially forests. Additionally, unsustainable production of charcoal contributes to deforestation, forest degradation, and air pollution. It is estimated that more than 7,383 premature deaths in Rwanda are attributable to household air pollution annually with the total welfare losses of USD674 million per year.<sup>12</sup>

9. School feeding has been an integral part of the GOR's strategy to address children's hunger during the school day, to support Rwanda's human capital creation, and to expand access to educational opportunities to disadvantaged children, particularly from low-income families. The GOR has scaled up the School Feeding Program, from pre-primary to include all levels up to and including secondary schools, equipped schools with kitchens and cooking stoves, and provided a subsidy for each student's meal to complement parents' contributions. Rwanda has a total of 8,147 pre-primary to secondary schools, which should serve three meals a day. Most schools rely on firewood for cooking. A pre-feasibility study funded by the European Union estimated that 482 institutional public boarding schools would need about 71,000 tons of firewood burnt for cooking each year, assuming an average per capita consumption of firewood per day of 1.33 kilogram, and students living at school's facilities for 10 months per year.

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<sup>9</sup> IEA, 2023, [Access to electricity improves slightly in 2023, but still far from the pace needed to meet SDG7](#).

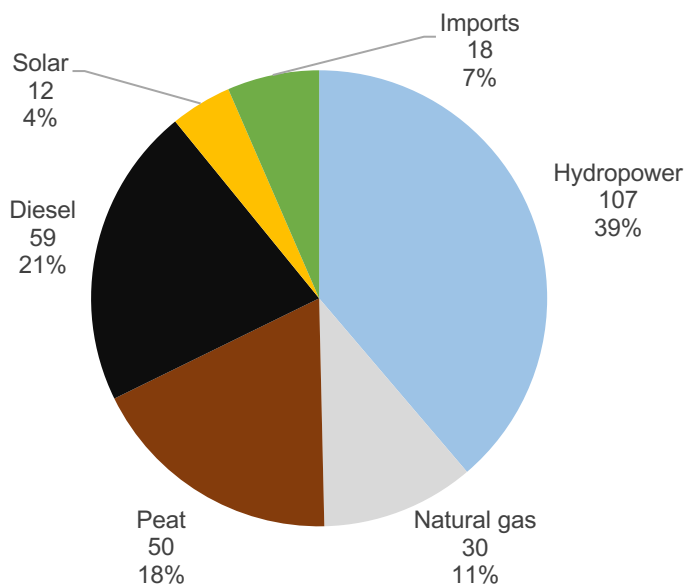
<sup>10</sup> REG, July 2022, [Annual Report 2021-2022](#).

<sup>11</sup> National Institute of Statistics of Rwanda, 2022, [Main Indicators: 5th Rwanda Population and Housing Census](#).

<sup>12</sup> World Bank and Institute for Health Metrics and Evaluation, 2016. [The Cost of Air Pollution: Strengthening the Economic Case for Action](#).

The study determined that this could lead to about 114,000 tons of CO<sub>2</sub> emissions per year, while exacerbating deforestation in Rwanda.

**Figure 4:** Rwanda installed capacity by technology (MW), June 2022 (source: REG)<sup>13</sup>



### Electricity Demand and Supply

10. Rwanda's electricity consumption is growing at a fast rate, driven by increasing electrification and a growing economy. Electricity consumption has grown eight percent annually from 690 GWh in 2016 to 1,130 GWh in 2022. Peak demand grew from 119 MW in 2016 to 185 MW in 2022. If current growth rates keep their pace until 2030, electricity consumption and peak demand would reach around 2,100 GWh and 350 MW, respectively.

11. To keep up with the growing demand, Rwanda's electricity generation capacity nearly quadrupled from 76 MW in 2010 to 276 MW in June 2022. The country's capacity mix is composed of 50 percent thermal electricity (21% diesel, 18% peat, 11% gas), followed by hydropower (39%) and solar (4%). The remaining seven percent is imported from neighboring countries. Rwanda generated 1,070 GWh during the fiscal year ending June 2022. This includes 46 percent fossil fuels (20% natural gas, 18% diesel, 8% peat), 45 percent renewables (43% hydropower, 2% solar) and nine percent imports. According to REG, a number of plants will come online in 2024, including peat, natural gas, hydro, and solar electricity plants. As such, REG expects Rwanda's electricity mix to be composed of 50 percent hydropower, 20 percent natural gas, 17 percent peat, five percent diesel, and eight percent solar by 2024.<sup>14</sup>

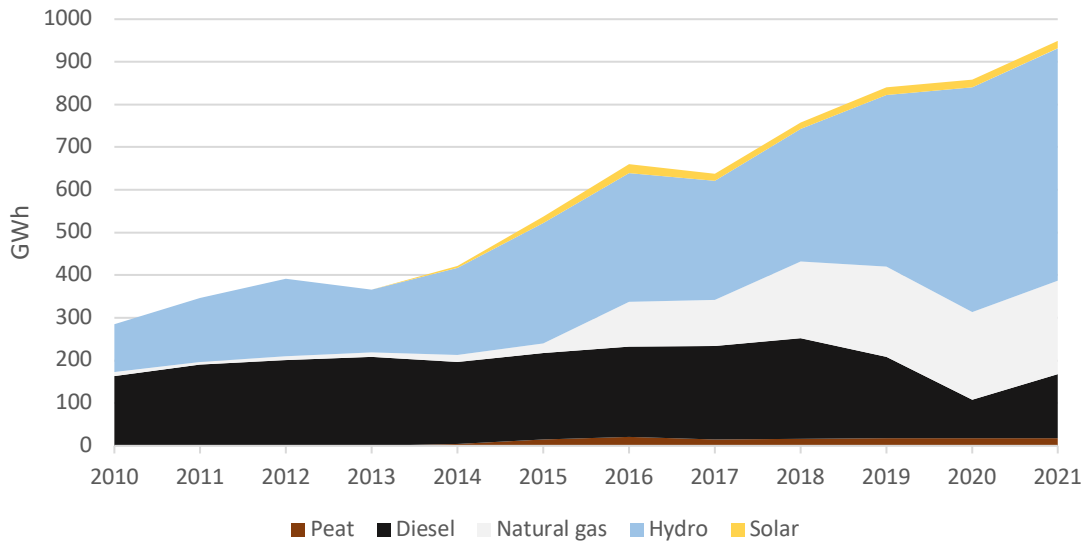
12. In 2021, Rwanda emitted 1.2 million tons of CO<sub>2</sub>, of which 16 percent were from the electricity sector. Rwanda is vying to reduce its reliance on expensive and polluting diesel electricity by installing new renewable and fossil fuel capacity. In the last decade, increases in hydropower and natural gas electricity generation have enabled the country

<sup>13</sup> REG, July 2022, [Annual Report 2021-2022](#).

<sup>14</sup> REG website, 2023, [Generation](#).

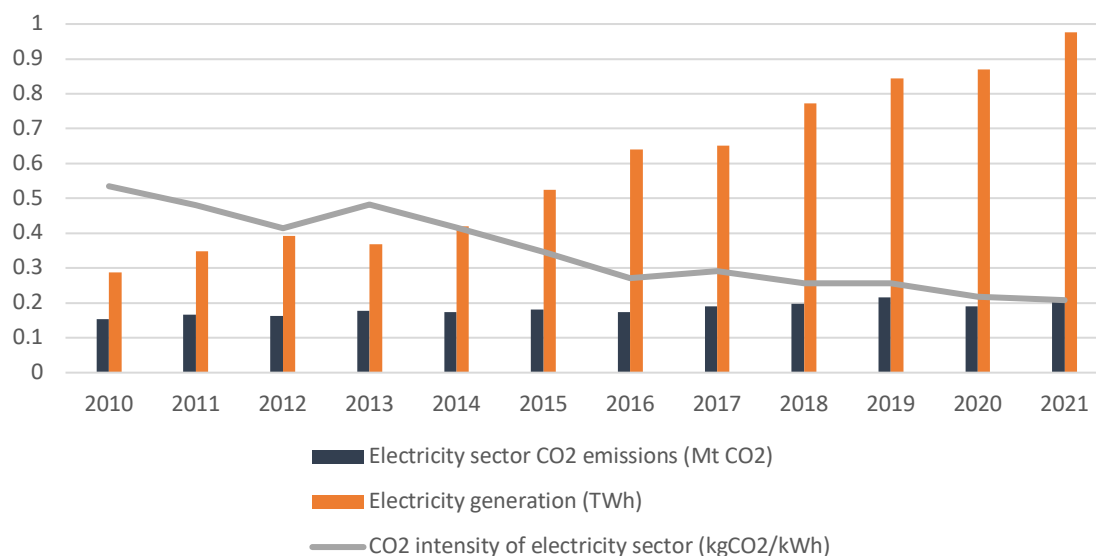
to meet the incremental electricity demand and reduce generation from peat and diesel (Figure 5). While Rwanda’s power sector CO<sub>2</sub> emissions rose between 2010 and 2021 (Figure 6), their growth has been slower than that of production, enabling a decrease in CO<sub>2</sub> emissions intensity from 0.53 kg CO<sub>2</sub>/kWh in 2010 to 0.21 kg CO<sub>2</sub>/kWh in 2021. This puts Rwanda’s electricity sector amongst the least intensive globally.

**Figure 5: Rwanda electricity generation by source (source: IEA)<sup>15</sup>**



<sup>15</sup> IEA, 2023, [World Energy Balances Dataset](#).

**Figure 6: Rwanda electricity sector CO<sub>2</sub> emissions and electricity generation**  
(source: EDGAR, IEA)<sup>16</sup>



### Electricity Transmission & Distribution

13. With the impetus provided by the electricity access targets and the growing electricity demand, Rwanda's transmission and distribution grid has grown considerably. The country's transmission network nearly doubled in length between 2016 and 2022, growing from 574 km to 973 km. Likewise, the distribution network is also developing at a fast pace. The number of connections grew from less than 600,000 in 2016 to more than 2,000,000 in 2022. The development of Rwanda's transmission and distribution network is supported by development partners.<sup>17</sup> In April 2022, AfDB provided a loan of USD180 million towards the construction of more than 1,000km of MV lines and 3,300 km of LV lines.<sup>18</sup> The project also includes the installation of 137km-high voltage lines, six substations and modernization of more than 1,200 distribution transformers, as well as associated infrastructure.

14. The expansion of the domestic network is coinciding with the creation of interconnections between Rwanda's electricity grid and neighboring Uganda and Kenya. Rwanda currently has 18 MW of import capacity via two lines with its neighboring countries. Further interconnections are expected to be established over the medium term. An upgrade of the current 220 kV line between Mbarara and Masaka<sup>19</sup> in south-west Uganda with a planned 400 kV transmission line is expected to enable sustained export volumes, and the construction of a 64 km 220 kV line connecting Kigoma with the Burundi border via Gisagara was recently completed.<sup>20</sup> REG envisions Rwanda could be importing up to 75 MW of electricity and exporting up to 30 MW by 2050.

<sup>16</sup> European Commission, 2023, [EDGAR - The Emissions Database for Global Atmospheric Research](#).

<sup>17</sup> REG, July 2022, [Annual Report 2021-2022](#).

<sup>18</sup> African Energy Portal, April 2022, [Rwanda: AfDB finances electrification of 77,400 homes with a \\$180 million loan](#).

<sup>19</sup> UETCL, 2023, [Masaka-Mbarara 400kV Transmission Project](#).

<sup>20</sup> REG, June 2023, [Rwanda Transmission Master Plan \(2023 2030\)](#).

15. Rwanda is also among the top performers in East Africa in terms of quality of electricity service delivery although there remain opportunities to further improve reliability and efficiency of services. Investments in infrastructure improvements and installation of appropriate hardware and software systems at the EUCL have resulted in reduction in the System Average Interruption Duration Index (SAIDI) from 88 hours in 2016 to 18.6 hours in 2022, and in the System Average Interruption Frequency Index (SAIFI) from 121 interruptions to 45.7 interruptions during the same timeframe.<sup>21</sup> However, the Multi-Tier Framework Survey undertaken by the World Bank in 2022 suggested that more than half of Rwandan households still face more than 4 interruptions and more than 2 hours of outages per day. Similarly, the Rwanda Enterprise Survey 2019<sup>22</sup> reported that 39 percent of firms in Rwanda experience electrical outages. System losses are still relatively high, at more than 18 percent in 2022.

### Plans and Targets

16. Looking ahead, Rwanda will continue to decarbonize its economy and provide clean energy access to its citizens. Vision 2050, an overarching vision for Rwanda's development towards 2050 and a successor to Vision 2020, provides long-term goals for the country's energy sector. Under its pillar 'Sustainable supply and demand for energy', the government aims to have at least 60 percent of renewable energy in the electricity generation mix and 100 percent electricity access by 2030. The country has also conditionally committed to reduce emissions by 38 percent from business-as-usual projections by 2030 in its NDC.<sup>23</sup> While the NDC does not provide specific targets for the electricity sector, Rwanda has committed to reduce energy sector greenhouse gas emissions by 1.5 million tons CO<sub>2</sub>e compared to business-as-usual projections (conditional on international support). To achieve this goal, the plan sees increased electrification and electricity access and the use of hydropower and solar resources as the main contributors to GHG emissions mitigation.

17. Rwanda's NST1,<sup>24</sup> which provides the foundation and vehicle towards Vision 2050, aims for the country to achieve middle-income status by 2035 and high-income status by 2050. As one of its core objectives, the strategy targets universal electricity access and halving of the number of households dependent on firewood as a source of energy for cooking from 79.9 percent (2016/17) to 42 percent by 2024.

18. Rwanda's energy sector long-term direction is guided by the Rwanda Energy Policy (REP)<sup>25</sup> and the ESSP<sup>26</sup>. REP and ESSP are mutually reinforcing. Whereas the REP outlines a long-term vision, provides high-level goals, and recommends clear and coordinated approaches for achieving that vision, the ESSP outlines targets and an implementation framework against which progress towards the realization of the REP is measured. The latest ESSP was published in September 2018 and provides targets up to 2024. The total investment needed to reach the targets set by the ESSP is estimated at USD 3 billion, with more than half set to finance additional generation capacity. The

<sup>21</sup> REG, July 2022, [Annual Report 2021-2022](#).

<sup>22</sup> WB, 2019, [Enterprise Surveys: Rwanda 2019 Country Profile](#).

<sup>23</sup> Rwanda Environment Management Authority, 2023. [Climate Change](#).

<sup>24</sup> NIRDA, [National Strategy for Transformation \(NST1\) 2017-2024](#).

<sup>25</sup> RURA, March 2015, [Rwanda Energy Policy](#).

<sup>26</sup> REG, September 2018, [Energy Sector Strategic Plan](#).

plan sets a number of high-level objectives including electricity access, generation capacity, reliability of electricity supply, reduction in transmission and distribution losses, etc. The REP and ESSP reflect the current status of the sector and provide guidance for a number of supporting activities such as the ‘Least Cost Development Plan’. These plans are developed to implement the ESSP and REP. In line with the objectives set in the ESSP and REP, two-thirds of planned new electricity generation capacity is expected to come from renewable sources in REG’s latest Least Cost Power Development Plan (2023-2050).<sup>27</sup>

### **Institutional Context**

19. The REG is a commercially operated state-owned enterprise, with a mandate to develop and operate all public sector energy sector infrastructure and act as the off taker of all private investments in electricity generation. The organizational restructuring in 2014 separated the electric utility from the water utility, forming the REG for electricity sector development and operation, along with its two independent subsidiaries, EUCL and EDCL. The separation allowed for better governance and clear financial accountability between revenue-generating service functions (under EUCL) and non-revenue-generating infrastructure development (under EDCL). The holding company, REG, as well as its affiliated companies are governed under company law as opposed to public service law, which entails stricter requirements in terms of transparency and management accountability. REG is overseen by the Ministry of Infrastructure (MININFRA) and regulated by the Rwanda Utilities Regulatory Agency, an independent regulator. The regulator evaluates the revenue requirements of REG and proposes electricity tariffs accounting for affordability constraints.

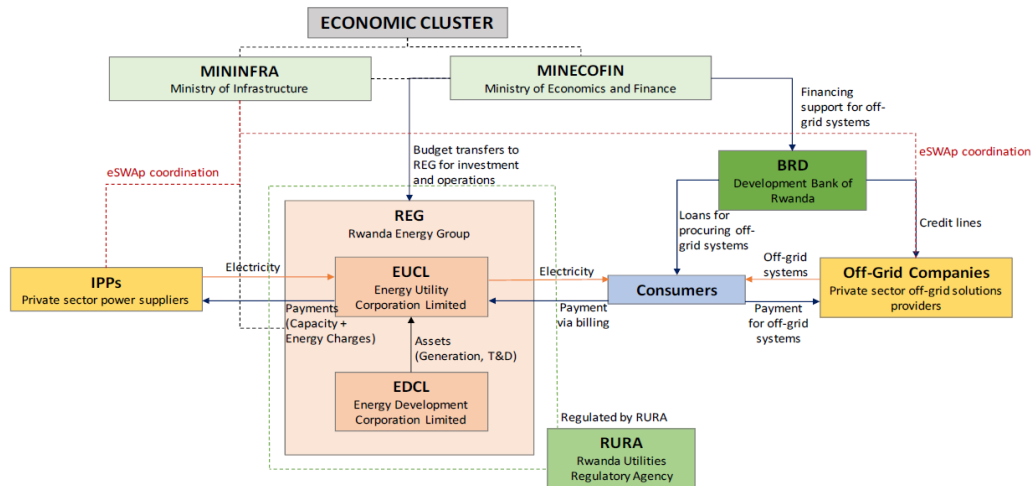
20. The BRD, among its services, provides financing support to the off-grid sector through the Renewable Energy Fund, which is one of the main vehicles of the Government in promoting private investment in off-grid energy. It offers loans and results-based grants to households and small businesses for procuring off-grid solar devices, as well as credit lines to private sector off-grid solution providers.

21. MINECOFIN issues budget transfers to the energy sector, while the Economic Cluster of the Cabinet has oversight over higher-level sector policy decisions (Figure 7).

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<sup>27</sup> REG, June 2023, [Rwanda: Least Cost Power Development Plan \(LCPDP\) 2023-2050](#).

**Figure 7: Institutional structure of Rwanda energy sector (Source: World Bank)**



22. Sustained reforms have led to improvements in the financial performance of REG while rapidly increasing electricity access, but REG still relies on fiscal transfers for both investment and operational purposes. REG’s operating cost-recovery (excluding subsidies) has improved from 70 percent in FY2014-15 to over 87 percent in FY2020-21, accompanied by an improvement in all key profitability metrics, during a period which saw a doubling in electricity access rate. Yet a high cost of service and affordability constraints to tariff increases continue to keep REG reliant on subsidies.

## Annex 4: Sovereign Credit Fact Sheet

1. **Background.** Rwanda is a small, landlocked, low-income country in Eastern Africa, with a population of around 13.5 million and income per capita of around USD950 (around USD3,000 in purchasing power parity). Since the devastating civil war of 1994 Rwanda has made a decisive turnaround. Underpinning the good performance was an uninterrupted period of political stability, government's strong focus on its home-grown development agenda, investment in infrastructure and human capital, as well as support from development partners. Rwanda has put in place a relatively strong institutional framework and reformed its private sector business environment. Macroeconomic stability has been maintained, and the country has embraced regional integration through the East African Community (EAC). To overcome infrastructure constraints, the government has been promoting a service-oriented development strategy, with a focus on international business hospitality and mid/high-end tourism.

2. As a result, economic growth has been robust for the past two decades, at 7.5 percent per year on average. Access to basic services has improved, infant mortality fell by a half, and poverty declined from 77 percent in 2001 to 55 percent in 2017, according to official statistics. Hailed as a success story, Rwanda has become an exemplar of development among the donor community.

3. Still, viewed in absolute terms, Rwanda's development challenges are formidable. Half of the population lives in extreme poverty. Pervasive infrastructure shortages result in high transportation costs and render many businesses uncompetitive. Human capital is still low. Export base is very small (around 10 percent of GDP) and narrow (agriculture, limited mining products). Agriculture accounts for a third of the economy (much of it subsistence farming) and 60 percent of employment. There is a large informal sector.

Selected Indicators	2019	2020	2021	2022	2023*	2024*	2025*
GDP growth 1/	9.5	-3.4	10.9	8.2	6.2	6.7	7.0
Inflation (e.o.p.) 1/	6.7	3.7	1.9	21.6	7.8	5.0	5.0
Fiscal balance 2/	-8.1	-9.1	-8.6	-7.6	-7.3	-6.5	-4.8
Public debt 3/	56.8	72.4	73.4	67.1	69.1	74.4	74.9
Current account balance	-11.9	-12.1	-11.2	-9.8	-11.3	-10.5	-10.1
External debt	53.6	63.8	75.7	72.5	75.1	79.0	81.0
FX reserves (e.o.p., USD billion)	1.38	1.72	1.89	1.69	1.78	2.05	2.36
Exchange rate (e.o.p., RWF/USD) 4/	923	973	1,010	1,071	..	..	..

Source: IMF Country report 23/198, 22/381; in percent of GDP, unless indicated otherwise; '\*' = projections; 'e.o.p.' = end-of-period

Notes: 1/ percent change y/y; 2/ fiscal year basis (FY is Jul to Jun); 3/ incl. guarantees; 4/ data from central bank, 2023 as of Sep 22

4. Macroeconomic situation has been generally stable. Amid high growth, inflation has been contained, but volatile, reflecting volatility of agricultural output and other shocks. The central bank has recently transitioned to an inflation targeting regime. The structurally high current account deficit reflects Rwanda's high investment needs that is generally financed with official donor support and, increasingly, with foreign direct investment. The exchange rate has been managed along a moderately depreciating path, but with inflation targeting there is a need for more flexibility. International reserves, at around 5 months of imports, are adequate. The banking sector is small, but well-capitalized and profitable; non-performing loans are relatively low.



5. Rwanda has been under eight programs with the IMF in the past two decades. Since December 2022 it is under a non-disbursing Policy Coordination Instrument (PCI) and a parallel, USD319 million Resilience and Sustainability Facility arrangement (meant to address long-term climate change challenges)—with generally good performance.

6. **Recent developments.** The Covid pandemic caused a deep recession in 2020, but ultimately the impact has been much less than feared. While the service-orientation of the economy has unexpectedly become a vulnerability, the negative changes to tourism and business patterns turned out to be mostly temporary. The government responded with a large policy package. Since 2021, the economy has been recovering robustly, on the back of a strong performance of manufacturing and services, strong private consumption, and a rapid recovery in tourism. FX reserves have been generally stable, supported by inflows from development partners, while the exchange rate has kept on the historical trend of moderate depreciation.

7. However, the pandemic has left scars. The poor and vulnerable groups have been particularly affected. The unemployment rate remains high and has not yet come down to pre-covid levels. The level of GDP remains below of what has been predicted back in 2019.

8. Furthermore, macroeconomic imbalances have emerged since around mid-2022, with high inflation, peaking at 21.7 percent in November 2022 (with food inflation in excess of 40 percent), due to high global and domestic food and energy prices, and strong private consumption. Depreciation has accelerated, while FX reserves fell from a peak of USD2 billion to USD1.7 billion as of June 2023. While the authorities have appropriately started to tighten policies, with lower planned deficits and higher interest rates (300bp cumulative hike delivered since early 2022), these imbalances may take some time to unwind.

9. **Outlook and risks.** Growth in 2023 is expected to moderate to 6.2 percent, due to weaker global environment, the ongoing policy tightening and the effect of the recent floods and landslides. Subsequently, and barring additional shocks, growth should gradually return to the potential of around 7.0-7.5 percent, supported by a robust public investment program. Inflation is expected to remain high, but gradually decline to around 8 percent by end-2023, mostly thanks to the base effect. Fiscal deficit is expected to continue moderating in the medium term, along some measured fiscal consolidation, but may deteriorate in FY24 due to post-flood reconstruction needs.

10. Despite the recent shocks, Rwanda's public debt remains sustainable, according to the IMF, with moderate risk of debt distress. Between 2021 and 2019, debt has increased by 30 percentage points, to 57 percent of GDP, to finance large public investments. During 2020-21, it has increased by further 15 percentage points, because of the pandemic. Potential risks include weaker external environment, lower concessional financing, regional tensions, and terms-of-trade shocks.

11. Factors mitigating these risks include the highly concessional nature of debt, which makes it affordable, adequate FX reserves, continued access to markets (last tested in August 2021), country's robust growth potential and good relations with development partners. For 2023-25, new financing commitment comfortably exceed

external amortizations. According to observers, the authorities remain committed to fiscal consolidation, as evidenced by three consecutive years of declining deficits. Ultimately, with strong growth and revenue-based fiscal consolidation to balance the continued capital outlays, debt is expected to return to the 65 percent anchor by 2030.

12. Rwanda's sovereign risk rating are B+ (Fitch, S&P) and B2 (Moody's). Over 2020-21 all agencies changed the rating outlook to 'negative', because of the pandemic's longer than expected impact on fiscal accounts and a risk that it might have durably impaired important sectors of the economy, such as tourism. However, as the economy has proven resilient to the many shocks, and growing strongly, Fitch and S&P have reverted the outlook back to stable, in 2023.